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Making Sense of the Access Problem: A New Methodology for Analyzing the Postsecondary Education Decision

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Making Sense of the Access Problem: A New Methodology for Analyzing the Postsecondary Education Decision

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University

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Dedication and Acknowledgements

This dissertation is dedicated to my family; without each of them this would not have been possible. To my mother, Diana, who instilled in me a love of learning and the belief I could accomplish anything and to my father, John, who taught me the value of hard work and achieving the goals you set. To my husband, Rich, who was my constant sounding board and touchstone and to my children, Griffin and Davis, who have imparted the wisdom only a child can possess. I thank you for the sacrifices and the support during this process.

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ABSTRACT

Making Sense of the Access Problem: A New Methodology for Analyzing the Postsecondary Education Decision

By: Farrah Stone Graham, Ph.D., Public Policy and Administration

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This study is interested in defining new variables that contribute to the explanation of whether or not an individual applies to postsecondary institutions. Prior research has explained differences based on demographic variables, such as first generation status, income and race, and differences in information and social support that an individual possesses. While these variables have a significant effect on the decision, they do not completely explain why individuals decide to pursue postsecondary education.

This research suggests that how an individual moves through the decision process, as well as how information is interpreted and used will have an effect on the ultimate decision outcome. The Sense-Making model (Dervin, 2003) is adapted here to define the differences in the decision process. A telephone survey was conducted with a randomly selected sample of 448 residents of the Commonwealth of Virginia asking them to describe their decision process regarding participating in postsecondary

education based on the variables comprising the Sense-Making model. Stepwise logistic regression was used to determine the effect of the demographics-based and Sense-Making model variables on the likelihood that an individual applies to postsecondary education.

The descriptive analysis of the survey findings indicated that respondents do not rely solely on a rational, information-based decision process. The resulting model produced by the stepwise process indicated that income and familiarity with postsecondary education had the strongest effects on the likelihood of applying, which is consistent with the existing literature. As for the Sense-Making variables, the analysis provided a set of variables whose presence makes a respondent less likely to apply. Feeling a lack of control over the decision outcome, perceiving information as not supportive to the process, using social support to make the decision and noting social support and school characteristics as a barrier all decreased the likelihood of respondents applying.

The findings of the descriptive and predictive analysis defined the shortcomings of information and indicate that social support, like information, may not always facilitate the decision process. Recommendations are made to create information that is more supportive and will accurately portray the work necessary to prepare for postsecondary education and to create participatory programming to address misperceptions and acceptance of information. These findings provide the basis for additional research to define how information can support the decision process.

CHAPTER ONE
INTRODUCTION AND STUDY OVERVIEW

The Issue of Access

The decision of whether or not a person goes to college has become increasingly important in the past three decades on an individual, institutional and societal level. First, there are significant individual benefits to gaining a higher education. A bachelor's degree provides greater monetary returns and has become a prerequisite for almost any job. "Individuals with a baccalaureate degree earn on average 40% more- the equivalent of $900,000 – over a lifetime than those who hold only a high school credential (Ruppert, 2003, p. 3)." Understanding the career benefits, a growing number of high school graduates are attempting to gain some form of postsecondary education. Additionally, working adults also have the incentive to complete a postsecondary degree to advance their careers. The increased demand has made the choice to pursue a college degree important for an ever-increasing number of students. However, not all colleges and universities have increased their enrollment numbers to meet the demand. This excess demand has caused a greater level of competition for available seats, which may cause some students to be excluded from the process as well.

Second, colleges and universities have a stake in whether students decide to enroll in higher education. They are increasingly competing for students in order to maintain or increase their school's prestige or reputation. "Skyrocketing competition for students has led to a rise in marketing by moderately selective institutions in response to enrollment trends…All of the best marketing techniques have been brought to bear on college admissions: marketing and public relations consultants, focus groups

for prospective students, and institutional repositioning (Schurenberg, 1989, as cited in McDonough, 1997)." This indicates the importance of understanding the college choice decision at the institutional level.

Additionally, many universities, especially publicly funded ones, have an interest in creating a diverse student body and ensuring that students from all backgrounds have the opportunity to attend (Duderstadt & Womack, 2003). An increasing number of state governments, as well as the colleges and universities themselves, have made providing access to low-income students a part of their performance measurement process ("State Planning Documents," n.d.). These two factors have created an environment where colleges and universities are interested in influencing how the college choice decision is made and whether or not students choose higher education.

Finally, society has an interest in generating a more educated population in order to increase the standard of living. From an economic perspective, benefits include enhanced economic competitiveness, increased government revenues resulting from higher income levels and social and economic equality (Hossler, Schmit & Vesper, 1999). With respect to the last of these benefits, economic equality, a higher education can provide those with low socio-economic status the ability to change their circumstances. Given the positive societal outcomes, government and policymakers aim to have all students leaving high school possess the opportunity to enter the higher education system.

Even with all the benefits to gaining a postsecondary education, not all individuals take advantage of the opportunity, especially those who could benefit most.

Research has indicated that while many low income students, racial minorities, and first generation students have aspirations to obtain a higher education, a much smaller number actually attend (Adelman, 2002; Education Trust, 2001; Ficklen & Stone, 2002; Sanoff, 2003; Venezia, Kirst & Antonio, 2003). With respect to adult learners, "the nation's labor force includes 54 million adults who lack a college degree; of those nearly 34 million have no college experience at all (Pusser et al, 2007)." Given the benefits that obtaining a higher education provides society, as well as individuals, it is important to understand why certain prospective students decide not to participate in postsecondary education.

The College Choice Process

In order to understand the issue of why these students choose not to attend, a greater understanding of the population in question is necessary, specifically with regard to how they manage the college choice decision. Previous research has indicated distinct differences in the college decision-making process based on family socio-economic status and education level of the parental figure. Race, income and parental education play important roles in who and what influences students in their college decision-making process (Cabrera & La Nasa, 2000a; Cabrera & La Nasa 2000b; Cabrera & La Nasa, 2001; Ceja, 2006; Choy, Horn, Nunez, & Chen, 2000; Conklin & Dailey, 1981; Flint, 1992; Hossler, 1999; Stage & Hossler, 1989; Hurtado et al, 1997; Keller & McKewon, 1984; Kelpe-Kern, 2000; McDonough, 1997; Terenzini et al., 2001). McDonough (1997) found that "the patterns of students' aspirations ... were shaped by the class context of the communities, families, and schools in which students lived their

daily lives" (p. 151). This contrasts with the supposition that individual rather than community factors are crucial to the narrowing of the college-choice set (Cabrera & LaNasa, 2000; McDonough, 1997). Also, numerous research studies have indicated that the quality and quantity of information a person has available regarding postsecondary education is directly related to socio-economic status, with low-income and first generation students having less information with which to make decisions (Akerhielm, et al, 1998; Cabrera & De Nasa, 2000; Flippen & Graham, 2005; Hossler, Schmit, & Vesper, 1999; Ikenberry & Hartle, 1998; McDonough, 1997; NCES, 2003; Pathways, 2003; Venezia, Krist, &Antonio, 2003). As for adult learners, those individuals that have delayed participation in postsecondary education, the college choice literature has not included this population. However, research has indicated characteristics that have an effect on the likelihood of success (i.e., completing a postsecondary degree). Many are the same as the variables of the college choice process of the traditional aged student, such as low-income, minority status, and having social support. But characteristics of the individual's personal life also have an effect, for example, being a single parent or working full time (Golonka, S. & Matus-Grossman, 2001; Levin, J.S., 2007; Pusser et al, 2007; Timarong, A., Temaungil, M., & Sukrad, W., 2002). These personal life characteristics inevitably have an effect on the decision of whether or not to participate in postsecondary education as well. Understanding that there are distinct differences in the decision-making process indicates the need to examine the following research question:

How do differences in the decision-making process affect whether a student applies to colleges and universities?

Problems with the Theoretical Model of Current Access Programs

Research has determined that the low attendance rates by low-income, first generation and minority students is affected by a lower amount of information about higher education and a lower familiarity with the process of applying to a postsecondary institution. “Historically, special programs and policies generally have assumed a deficit model and have centered on enabling students to overcome… [an] insufficient understanding of the world of higher education (Hagedorn & Tierney, 2002, p.1).” Therefore, the programs are designed to overcome the deficit by providing the students and their parents with additional information about higher education and specific institutions and mentoring services to assist them in traversing the admissions process.

By examining the research basis and program structure it can be assumed that current access programs utilize a transmission model of communication (Shannon & Weaver, 1949). In the transmission model, there are three main components: the source, the message and the receiver. Applying this model to the case in question, the source, in this case a government or nonprofit organization sends a message, the information, through a channel, the program, to a source, the parents and students. The problem of students having a lower level of information has been reduced to getting the sources’ message to the correct receiver, the prospective student, accurately. Any analysis of this model focuses on the “expert” status of the source, the accuracy of the message and whether the receiver received the intended message.

However, findings from this type of analysis do not provide explanation for the lack of intended effects from the efforts- prospective students actually applying to colleges and universities.

The College Opportunity and Career Help (COACH) Program provides an example of the disconnection between the program structure and the intended effects. Tom Kane, who worked to create COACH, "says he has found that, for the seniors who are engaged in the program, aspirations are not the issue. 'If anything, the aspirations of kids in our study are too high given their academic preparation; they are expecting to go to college at unrealistically high rates.' Kane acknowledges that better academic preparation might ultimately prove to be even more important in getting youngsters ready for college than the information and support the COACH program provides. But he says, 'our idea is to start with the easiest, least costly approach and work backwards.'(Sanoff, 2003)" So many programs take the same approach that the COACH program has, to provide more information about college and mentoring assistance to help make sure students complete their forms on time. However, as Mr. Kane acknowledged, there are deeper issues with which to deal. Students are receiving all the information and the messages about higher education, but they still have not changed their behavior to obtain a higher education. This fact points to a different problem that has been overlooked.

Research has defined information in the process by two variables, receipt and accuracy. The level of information students possess, as previously discussed, indicates whether an individual has received the information the source(s) were providing, a

measurement of receipt of information. The literature also addresses misperceptions about higher education and how that affects whether an individual participates. This variable reflects the accuracy of the message received. The strategies that access programs use try to address these two variables in the hope of increasing the rate of the intended outcome, participation in postsecondary education.

When research analyzing information in the process is reduced to accuracy and receipt of message, an element is missing, how the receiver, the prospective student, interpreted the information. The information provided, or the message, is defined by the source, without acknowledging how it will be used by the receiver. It is precisely the process of how the message is used, to facilitate applying to and attending college, which should be the focus of research and the strategies of the access programs themselves. What becomes important to achieving the desired outcome is not that students have enough information, but instead how they interpret the information and fit its meaning into their lives and goals. Interpretation and construction of the information's meaning is the key to understanding the differences in the decision-making process of the population which will directly affect the decision outcome.

Currently, the important variables for analyzing whether an individual participates in postsecondary education are demographic categories, like first generation status, income level, and race, and the level of information received and social supports, which are reflected by overall familiarity with postsecondary education. These variables produce a demographics-based model that ignores difference in decision making and how information is used in the process. Defining these factors

could inform new program strategies that increase the intended outcome, participation in postsecondary education.

A New Approach: The Sense-Making Model

Utilizing a new model for analysis that focuses on defining the receiver in terms of interpretation and how messages are used will provide the ability to increase effective communication and utilization of information. The Sense-Making model (Dervin, 2003) provides a much more in-depth description of the differences in the decision-making process and assists in defining the receiver's interpretation. Basically, the Sense-Making model conceptualizes difference not according to demographics or other static categories but rather according to how people attend phenomena differently. The focus is on how people make connections: how they use information to construct bridges over gaps of understanding and what accounts for differences in observations (Dervin, 2003, p.7).

The model rests on an assumption of discontinuity, that information's meaning is not constant across individuals. Instead, the interpretation of meaning is socially constructed. An individual's experiences, circumstances and perspective can lead them to come to different conclusions, or create different meanings, about the same situation or information. This is not to say that there is no objective meaning to anything. Sense-Making acknowledges that an orderly, objective meaning of reality exists. In this way it is a critical theory that assumes that there is an objective reality and meaning, but for individuals, it is the subjective, socially constructed meaning upon which they act. This assumption is well suited for examining college choice because it acknowledges that

objective information exists, for example, the actual cost of tuition and fees for attending a college or university. However, what really matters in the choice process is an individual's interpretation of the information and the meaning or sense that is created by his or her individual perspective. Using the same example of tuition, two low-income students can receive the same objective information and the meaning created for one may be "I will have to apply for student loans." However, for the other, it may be "higher education is not an option for me." This distinction in meaning can be the difference in applying to a college or university or not.

This new approach to analyzing the problem will also add to the communication or information dissemination process. The information sources will have a better understanding of the interpretation and usefulness of their current output and can utilize the findings to make changes to their disseminated information from a users' perspective instead of the traditional expert perspective. Using this understanding, the information provided to prospective students and parents could be adapted to better fit their needs and create realistic expectations about obtaining a postsecondary education. In addition, the ability to make adjustments to the source information provided allows everyone who receives the information to benefit, instead of only those who participate in an access program benefiting. As a result of focusing on transmission of information and static demographic categories, current public policy on increasing access is less effective than it ultimately could be.

Study Outline

The next chapter provides a review of a number of streams of literature relevant to the study. First, the problem of access in higher education is defined, providing the context for the research question of the study. The evolution of the college choice literature is also be examined, as it has been used as a basis for understanding differences in individual decision-making and the link between aspiration for gaining a higher education and actual attendance. Researchers have focused on level of information and familiarity with higher education and demographic categories as the main variables explaining questions of access. Explanation of this research is linked to communication theory to explain the underlying model of current access programs. It is the utilization of this underlying model, the transmission model of communication, which this research critiques.

Following the literature review, the methodology utilized for the study, as well as the Sense-Making model itself, is explained. Next, the results of the data analysis are presented. And finally, there is a discussion of the conclusions drawn from the findings and the corresponding recommendations for policy and program change.

CHAPTER TWO
LITERATURE REVIEW

The Access Problem

The acknowledgement that certain socio-economic groups are less likely to gain a postsecondary education is not a new one. Numerous studies have been conducted attempting to better define the issue of access in US higher education, all of them hoping to isolate the characteristics that have the greatest affect on the decision to attend a college or university. Consistently, studies have found significant difference in attendance rates based on socio-economic status (Adelman, 2002; Education Trust, 2001; Ficklen & Stone, 2002; Sanoff, 2003; Venezia, Kirst & Antonio, 2003).

In 2001, the Advisory Committee on Student Financial Assistance released a report called *Access Denied: Restoring the Nation's Commitment to Equal Educational Opportunity*. The Committee was attempting to define the progress toward the access goal in order to provide recommendations for improvement. The analysis indicated that low-income students continued to be less likely than their higher income counterparts to attend postsecondary education. The National Center for Education Statistics longitudinal study, Beginning Postsecondary Students, indicated a significant difference in those attending college based on socio-economic status, even when achievement test scores were taken into account. Examining those in the highest achievement quartile, seventy-eight percent of those in the lowest socio-economic status (SES) quartile attended college, while ninety-seven percent of those in the highest quartile did. The difference is even more significant for those in the lowest achievement quartile. Only

thirty-six percent of the lowest-SES students attended college, while seventy-seven percent of those in the highest-SES quartile attended.

In 2003, Venezia, Krist and Antonio conducted a study as a part of the Bridge Project supported by Stanford University, the Pew Charitable Trust, and the US Department of Education National Center for Postsecondary Improvement. The resulting report, examined student aspiration and preparation, current state policies and misunderstandings about college.

Their findings show that students do indeed possess a high level of aspiration for higher education. "Eighty-eight percent of 8th graders expect to participate in some form of postsecondary education, and approximately 70 percent of high school graduates do go to college within two years of graduating (Venezia, et al, 2003, p. 6)." While these numbers seem to indicate success, when the enrollment numbers are compared by family income and race a different pattern emerges. The percentage of low-income high school completers, or the bottom twenty percent of all family incomes, who enrolled in college the October after graduation is only fifty percent, compared to seventy-seven percent for those with high family income. Likewise, minorities were also less likely to be enrolled than their White counterparts. Black and Hispanic students enrolled at fifty-five and fifty-three percent respectively, while sixty-six percent of White students enrolled.

These research findings indicate a disconnection between aspiration and attendance, especially for those in the lowest income class. In order to completely understand the access problem it is necessary to determine why this disconnection is

occurring. Both aspiration and attendance are part of the larger decision of whether to obtain a higher education (Appendix A). Therefore, it is also necessary to completely understand the differences in how the decision is made. This study will address the following research question:

> How do differences in the decision-making process affect whether a student applies to colleges and universities?

The College Choice Process

Research on the college choice decision generally ties together two basic questions: aspiration, or choosing whether to gain a higher education at all; and then attendance, or choosing between a number of institutional alternatives. The linkage between the two questions indicates the important effects each has on the other. From a research perspective, the progression through these two questions generally has been broken into three stages: predisposition, which involves educational aspiration and intention to continue in the postsecondary level; search, which involves the accumulation and assimilation of information to develop a list of alternative institutions; and choice, which refers to actually applying to particular institutions and enrollment (Cabrera & La Nasa, 2000). This research is interested in gaining an understanding of the individuals that get lost between the two questions of aspiration and attendance, or those that never make it to the choice stage (Appendix A). Understanding and discovery of differences in the predisposition and search stage can provide guidance in determining the relevant differences in the choice process of whether to apply at all. In other words, the differences that affect one choice will be the same affecting the other.

College choice models can be distinguished by the variables they use to define the process. Some focus on the factors that influence the cognitive stages of decision making. Others focus on economic variables, which assume rational actors and the use of cost-benefit analysis for evaluation. And finally, some focus on the effect of sociological variables, which assumes that behavioral variables interact with background or social status variables to determine education decisions.

Some of the earliest models of college choice focused on defining the influencing individual characteristics and the stages of the decision-making process. For instance, Astin (1965) posed a choice model that examines the interaction of the characteristics of the individual and the college admissions process. To prove his hypothesis he attempts to correlate the student's input characteristics with the college trait characteristics. The factors, representing intellectualism, estheticism, status, leadership, pragmatism, and masculinity, represented student talent or potential for future achievement. He finds a high correlation between the sets of characteristics. Astin explains that college admissions officers and their efficient recruiting techniques must be the reason. His study sheds little light on the actual process by which choices are made. He notes the importance of several factors like cost, location, likelihood of admission, but states that it would be too difficult to prescribe a model that takes all of those into account.

Astin's model gives the institutional admission process too large a role in decision making to be applicable in the present. He also ignores seemingly the most important issue, the factors that create the differences in choices. This is a result of the

vastly different higher education market that existed prior to the 1980s. The percentage of high school students that were attending college was still low. Therefore, the admissions process carried greater weight in the decision. Probably more importantly, colleges and universities were much more homogeneous in their characteristics, as were the students themselves.

As the higher education landscape changed in the 1980s and an increasing number of students began to enter the market, the choice models adapted accordingly, focusing less on the institutional choice characteristics and more on the student. A number of models emerge based on economic theory. Jackson (1982) presents the assumption of preference. His study found that achievement is highly correlated with educational aspiration (i.e., students who do well will have a preference for college). He uses economic theory to describe a decision-making process of excluding institutions based on factors such as location, cost, or academic quality. The student then evaluates the characteristics of the remaining set of institutions to make a final decision. However, the study does not explain how initial institutions are chosen, again ignoring the search or information gathering phase of the process.

Similarly, Manski and Wise (1983) use a model of discrete (or quantal) response to assign a probability to the college alternatives. They assume that if an individual faces a set of college alternatives that are very similar, the predicted probabilities of attendance should be about the same for each of them (Manski and Wise, 1983). They hypothesize five general factors that determine choices of whether to attend college: academic aptitude, family income, cost and aid, quality of the high school (measured by

the proportion of students from the person's high school who go to colleges and the proportion going to other schools), and labor market conditions (measured by the expected annual income if the individual were to enter the labor force).

The decision of where to go to college is then a combination of the individual decision (application process) and institutional decision (admission process). The model incorporates two discrete choices and a continuous outcome. The discrete choices are the student's decision whether to apply to college and the college's decision whether to admit an applicant. The continuous outcome, which becomes their measure of school quality, is the average SAT score of freshman entering the school to which the student applies (Manski and Wise, 1983). Again, the explanation is confined to the description of differences in characteristics, instead of understanding differences in the process itself.

Recognizing the limitations of using a purely economic lens on the problem, a number of models follow that acknowledge the role of sociological factors. Kotler and Fox (1985) pose a four-stage model based on risk-reduction, integrating the cognitive, psychological theory with rational decision making. The four stages represent a tree diagram, where first the student makes the initial decision to investigate colleges, then gathers information in an orderly, comprehensive way, evaluates and eliminates choices to generate a set of options and finally makes a final choice from the options remaining. Throughout the process the student is evaluating and eliminating alternatives based on cost-benefit analysis. The study notes that the costs that are most difficult to quantify

(parental expectations and encouragement) are the most influential. This finding reinforces the significance of the sociological elements in the decision-making process.

In the 1980s and 1990s, the literature also begins to focus on the social impacts on the stages of the process, to produce more effective models that reflect the changing higher education market. Hanson and Litten (1982) are the first to describe college choice as a continuing process. They propose five-steps: having college aspirations; starting the search process; gathering information; sending applications; and enrolling. These five steps can be combined into three stages: 1) decision to participate in postsecondary education; 2) the investigation of institutions and development of alternatives to consider; 3) the process of applying and enrolling. They also are first to introduce public policy, such as financial aid, as an individual consideration.

Importance of the Information Search Stage

Chapman (1984) presents another view of the decision making stages in his model. First, the student goes through presearch and search, followed by applications, choice and enrollment. Student characteristics interact with external factors, which produce the students' expectations about college life. Chapman describes the search stage as "a fishing expedition" because students don't know which questions to ask. However, he acknowledges that most of the work in the decision-making process is done in the search stage.

Hossler and Gallagher (1987) further define the social processes that affect each stage in their model of college choice. The first stage is predisposition, which refers to the plans students develop for education or work after they graduate from high school.

Family background, academic performance, peers and other high school experience influence the development. Then the search stage is the place where students are discovering and evaluating possible colleges to which they will apply. During this stage the alternatives selected are influenced by social conditions and by what students learn about colleges. And the final stage is the choice stage, when students choose a school from among those they have considered. Hossler and Gallagher also note the lack of research and information on the student search process, and also acknowledge that it is the most important stage of the three.

In 1999, Hossler, Schmit and Vesper, combine the original three stage decision model (1987) with Schmit's (1991) model of information gathering. He examined search activities and found three types of gathering: 1) attentive (or passive) search, where students pay attention when the subject is discussed or read materials sent to them; 2) active, when students seek out discussions on the topic; and 3) interactive search that is comprised of student-initiated conversations with parents, admissions reps, and guidance counselors. The results showed that the type of gathering used was significantly related to student-centered variables, such as parental support and grade point average. In other words, the greater the value of the student variable was; the more active the search. They also found that the students that were more active in their search were more certain about which college characteristics were most important to them (Hossler and Gallagher, 1999).

Hossler, Schmit and Vesper suggest another theory that informs the college choice literature, information-processing. They describe information-processing as

making decisions as to what issues will require decisions and using information to make exclusion or evaluation statements about those issues (Hossler, Schmit & Vesper, 1999). It is a continuous process of reducing uncertainty. The concept implies a cyclical process whereby information is gathered to make a choice and the subsequent choice then informs another decision. This process also helps to inform the search and evaluation stage of the college choice process. These adjustments to the model are important because they acknowledge the importance of information and its use in the decision-making process.

McDonough (1997) builds on the qualitative, sociological-based framework and connects it to information use with her model. She seeks to provide more "micro-level insights" and analysis of how students proceed through their predisposition, search and choice phases (Hossler model) and examine how students' everyday lived experiences in social class communities and schools influence students' college choices. Deeply rooted in sociology, she examines group effects of decision making, "build[ing] on Weberian theories of status groups and intergenerational status transmission, as well as organizational theories of decision making to highlight the importance of diversity of organizational context and status culture background on individual decision making (McDonough, 1997, p.8)." Her work is based on three assumptions: 1) a student's cultural capital (shared preferences and attitudes that upper- and middle-class families transmit to their children that influence the decision-making process) will affect the level and quality of college education that student intends to acquire; 2) a student's choice of college will make sense in the context of that students friends, family, and

outlook, or habitus; and 3) through a process of bounded rationality, students will limit the number of alternatives actually considered.

This idea of bounded rationality is important. It is a criticism of the idea that students and parents have perfect information in making their choices. They are unable to effectively assess every school available. Instead, "most people settle for satisfactory alternatives due to time and resource limitations. These alternatives are influenced by their physical location, social networks, and environmental stimuli, as well as the anticipated goals and consequences for college (McDonough, 1997)." In a cost-benefit analysis of the decision-making process, the time it would take to evaluate every alternative sufficiently significantly outweighs the benefit reaped in the decision produced. Therefore, it is indeed rational to assume that perfect information regarding every alternative will not be gained.

This insight provides part of the theoretical foundation for explaining the differences in the search processes of parents and students. McDonough's model links the subjective definition of satisfactory level of information with the social influences on students. The linkage underscores the important role that information plays in the decision-making process.

Differences in Information and Support in the Decision Process

Using this theoretical understanding of the decision process, researchers have examined the relationship between the level of information one has regarding higher education and whether or not the individual seeks a higher education. Consistently, findings have indicated a significant relationship between information and income level;

the lower the income level, the less information one has (Akerhielm, et al, 1998; Cabrera & De Nasa, 2000; Flippen & Graham, 2005; Hossler, Schmit, & Vesper, 1999; Ikenberry & Hartle, 1998; McDonough, 1997; NCES, 2003; Pathways, 2003; Venezia, Krist, &Antonio, 2003).

Cabrera and DeNasa (2001) used logistic regression analysis to assess the affect of several school-based and family-based factors on the probability of becoming qualified to attend college, graduating from high school and actually applying to college. Assuming that academic preparation is a key to gaining access, the school-based factors were defined as ability at eighth grade, measured by NELS reading and mathematics test scores; a college qualification index developed by Berkner and Chavez (1997), based on cumulative GPA, senior class rank 1992 NELS aptitude scores and SAT and ACT scores; high school-based support, signifying whether the student received assistance with college or financial aid application procedures and writing application essays; and information sources on financial aid, including the number of sources utilized. To capture the social aspects of the question, the family-based factors were defined as at-risk factors, parental involvement, parental expectations, whether they planned to attend college ever, in the eighth grade, and at graduation. The at-risk factors were defined as whether the student came from a single-parent family, had siblings who dropped our of high school, had changed schools two or more times between first and eighth grade, and had repeated an earlier grade from first to eighth grade. To define parental involvement, a composite was created by asking students the frequency with

which they had discussed school courses, activities, grades, things studies in class, preparation for the ACT/SAT, and going to college with their parents.

The analysis indicated that socio-economic status was a relevant factor in the three stages examined. The lowest-SES students were 51% less likely than the highest-SES students to secure the necessary qualifications for college. Likewise, the highest-SES students were 55% more likely to apply to college than those in the lowest-SES (Cabrera & DeNasa, 2001). The most noteworthy factor in the choice to apply is the level of parental encouragement. Students in the lowest-SES were much less likely to receive a high level of encouragement. Only 54% of the lowest-SES students reported that their parents expected them to secure a bachelor's degree, while 92% of upper-SES parents had that expectation.

Information and support was also found to be a significant factor in probability of applying. "For every one unit increase in the amount of financial aid information, a high school student improves his or her likelihood of applying by 5%. Receiving help with application materials and college essays enhances the chances of applying by 11% and 8%, respectively (Cabrera & DeNasa, 2001, p. 140)."

Venezia, Krist and Antonio (2003) also address the role information and support plays in accurate perceptions of college. They utilized national level Census and US Department of Education data. To gain more in-depth insight and to study the connections with state-level policies, the team also gathered data in six states, California, Georgia, Illinois, Maryland, Oregon, and Texas. The project team conducted approximately 165 interviews with state level actors, as well as administrators from

universities and community colleges. Focus groups were also conducted with community college students, including when possible recent high school graduates. They also interviewed K-12 teachers and staff, as well as high school parents and students.

The findings indicated that overall the majority of parents, over sixty percent, had received college preparation information from their high schools. However, when the results were disaggregated by income level the percentages indicated disparities. In certain states, Illinois, Maryland and Oregon respectively, 42%, 44% and 47% of economically-disadvantaged parents had received college information, compared with 74%, 71% and 66% of their more economically-advantaged counterparts.

Research has also indicated that parental support and encouragement is directly related to participation in postsecondary education, with low income, minority and first generation students having less support. Many studies have attempted to define the role of the parent in the process. The parent has a role in setting expectations for attendance, initiating the discussion of the planning process and saving money to finance the education (Cabrera & La Nasa, 2000a; Cabrera & La Nasa 2000b; Choy, Horn, Nunez, & Chen, 2000; Cabrera & La Nasa, 2001; Conklin & Dailey, 1981; Flint, 1992; Keller & McKewon, 1984; Hossler, 1999; Stage & Hossler, 1989). Hossler (1999) and Hossler, Braxton, and Coopersmith (1989) suggest the parental role in college choice is greater during the earlier years of high school than later (i.e. when the disposition to attend college is formed). Studies have also determined that the role of the parent and other forms of supportive social networks create cultural capital necessary to effectively

make the decision (Kinzie et al, 2004; McDonough, 1999). Having parents and a social network that has participated in postsecondary education themselves provides a level of familiarity that makes the decision-making process easier for the prospective student.

Adult Learners and Access

The college choice literature has focused its' efforts on traditional aged students and their parents, however, this ignores a significant percentage of prospective students for postsecondary education. "Currently only about a quarter of undergraduates can still be considered 'traditional' – students who transition into college immediately after high school graduation, who attend exclusively full-time, who are financially dependent on their parents, and either do not work during the school year or work part-time (Choy, 2002 as cited in Social Science Research Council, 2005)." Not only are the students who fall outside of the definition of traditional student growing, the characteristics that make them non-traditional may have a significant effect on their participation.

There are a number of definitions of nontraditional students or adult learners and the differences between the terms can be difficult to pinpoint. For this study Voorhees and Lingenfelter's (2003) definition of adult learner is used: someone 25 years of age or older involved in postsecondary learning activities. Much of the literature on adult learners has focused on factors that affect their success in postsecondary education. However, these characteristics would also have an effect on whether or not they choose to participate in the first place.

Levin (2007) provided a typology of adult learners that categorizes the risk factors that affect success. Looking at the characteristics, minority status is noted, but

other risk factors indicate personal life characteristics playing a role. The individual's personal life having an effect, for example, being a single parent or working full time, has been indicated by a number of studies (Golonka, S. & Matus-Grossman, 2001; Levin, J.S., 2007; Pusser et al, 2007; Timarong, A., Temaungil, M., & Sukrad, W., 2002). This study will include adult learners in its population in order to gain a greater understanding of how these characteristics affect their decision-making process as well.

Table 1: Adult learner typology

Nontraditional student category	**Characteristics**
Minimal risk	One characteristic of nontraditional status, such as identity as an underrepresented minority or delayed college enrollment.
Moderate risk	Two or three characteristics of nontraditional status, such as identity as an underrepresented minority, a re-entry student or a person in need of financial aid.
High risk	Many characteristics of nontraditional status, such as minority and re-entry status, financial need, employment more than 20 hours a week or a role as a single parent.
Ultra-high risk	Many characteristics of nontraditional status as well participation in programs outside the higher-education mainstream. These programs — including non-credit continuing education (both non-certificate and externally certified programs and courses), contract training provided for employers, and for-credit continuing education — tend to place these students on the periphery of higher education.

Source: J.S. Levin (forthcoming). *Nontraditional Students and Community Colleges: The Conflict of Justice and Neoliberalism*. New York: Palgrave MacMillan

Perceptions and Misperceptions about Higher Education

Not only do low-income, minority and first generation students and their parents have less information, they also tend to have inaccurate perceptions of higher education. This is important because the most common solution to the access problem has been to provide more information to low-income students and parents. In order for that strategy to work, the target population must receive the message accurately and be able to use it for the intended purpose, to obtain a higher education. If misperception of information exists, this indicates a serious problem with utilizing the strategy of providing a greater level of information as a solution.

In their study, Venezia, et al (2003) attempt to define the misperceptions that parents and students, and even K-12 educators, have about higher education. All three groups expressed confusion and frustration when discussing their understanding of the entrance and preparation process. While the majority of students aspired to attend college, their knowledge of the college preparation process was lacking. For example, across the six states studied less than twelve percent of students knew all of the curricular requirements for admission to postsecondary institutions. The study also found that while they had aspirations, students had a certain level of apathy about the college preparation process and the majority had not engaged in many college preparation activities. It was also found that approximately half of the students wanted to go to the more-selective institution in their region, and less than a quarter aspired to attend less-selective options. Even when the aspiration was broken into honors and non-honors English students, the non-honors students showed a substantial interest in

the more selective schools. These findings indicate that students may not have a realistic idea of what it takes to get into college.

These conclusions are important to highlight because they define the opportunity for change. Perhaps the information provided plays a role in the misperception of admissions and preparation requirements. Gaining a better understanding of the meaning that parents and students develop from the information given provides the opportunity to define the disconnection between perception and reality. As a result of our society's eagerness for providing a college education for everyone, perhaps the actual process and experience has been misrepresented.

Theoretical Underpinnings of Current Access Program Models

It is necessary to examine how information messages are created in order to understand how the information is used and the meaning that is constructed. The access programs being discussed rely on information campaigns to address the problem. Communication theory provides the basis for understanding how these information campaigns are created and also how they are analyzed.

Transmission Model of Communication

Current access program structures are based on a model of communication known as the transmission model. Attributed to Claude Shannon and Warren Weaver (1949), the model was developed for Bell Telephone Labs to assist in developing a mathematical theory of communication. The original model consisted of five elements: an *information source,* which produces the message; a *transmitter,* which encodes the message into signals; a *channel*, which adapts the signal for transmission; a *receiver,*

which reconstructs the signal into a message; and the *destination,* where the message arrives. The last element is *noise*, a dysfunctional factor that creates interference with the message.

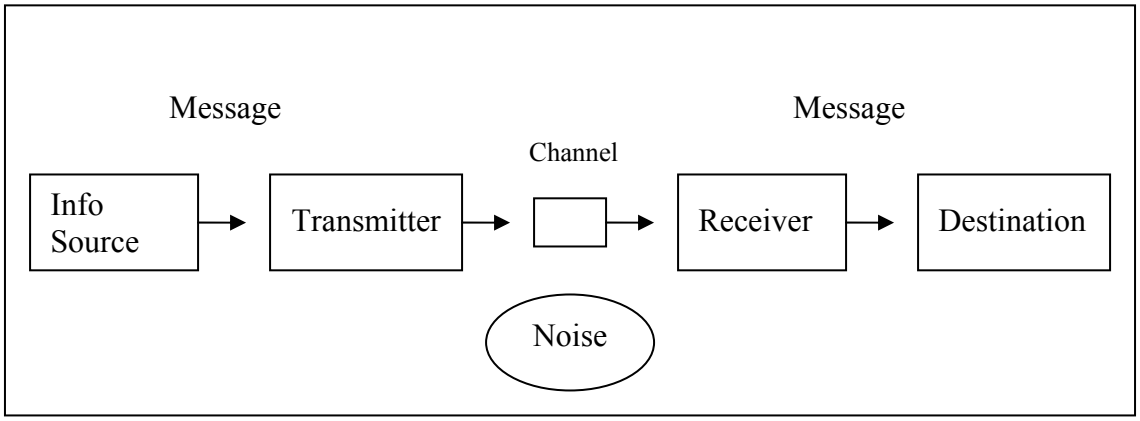


Figure 1: The Transmission Model of Communication

In the humanized version of this model the information source would be the speaker, or the one with a message to relay, and the destination would be the audience, or the one who is receiving the intended message. The model takes an informational approach to the communication process, focusing on how information is transmitted between the source and the receiver. Communication becomes a linear, one-way process. As such, the problems with communication are reduced to the question of accuracy and the focus for improvement is the transmission process itself and mitigating noise. The concept of noise acknowledges that messages can be distorted; however, the source of the distortion is a problem with the intentions of the source, not interpretation by the receiver. These caveats indicate the main problem with the transmission model. The focus of communication is the sender, or source. The source is the active decision-maker and determines the meaning of the message. Again, the process is one-way in nature. The system described lacks a feedback loop, or any input

from the receiver regarding the message sent. The interpretation of the receiver is ignored and does not play into the equation. The receiver is relegated to being a passive target (Beck, et al, 2004; Chandler, 1994).

The transmission model and its linear process is the starting point for understanding communication theory as a literature. While many researchers criticize the original model, their suggested alternatives still have the linear, one-way process, especially in mass information campaigns.

The Public Information Model

Grunig and Hunt (1984) have constructed four models describing the public relations practices in the United States. They indicate that most government produced information campaigns utilize the public information model. Its aim is the dissemination of information and provides a one-way flow of communication, which again reflects the traditional transmission model. When analysis is conducted, it studies whether messages really reach their intended receiver and are understood (Windahl & Signitzer, 1992). The findings from the access literature previously discussed indicate that this communication model is being used by government agencies and access programs. And more importantly, this is the form of analysis also. The variables of analysis are 1) whether the information was received and 2) whether the message was understood. Success is measured by whether or not the desired action, enrolling in higher education, was taken.

The source's goal is to provide the right message through the right channels to cause the audience to obey and take a certain action. Again, the source is in control and

active and the audience is passive. This model of a passive, obedient audience produces an unrealistic expectation for obtaining intended effects. "Indeed, the element of passivity on the part of the audience may also serve as an excuse or an explanation for the absence of effects. ("Those people are just too lazy to read what we have to say.") (Windahl & Signitzer, 1992, p. 173)."

Social Marketing

Another technique used to create information campaigns for access programs is social marketing. According to Kotler (1982), social marketing is the design, implementation, and control of programs seeking to increase the acceptability of a social idea or cause in target group(s). It utilizes concepts commonly used in commercial marketing, such as market segmentation, consumer research, concept development, communication, facilitation, incentives and exchange theory to maximize target group response. Andreasen (1995) describes it as the application of these commercial marketing techniques to create programs that influence the voluntary behavior of target audiences to improve their personal welfare and that of society.

The concept of social marketing has been applied to the access problem by the Pathways to College Network, an alliance of 38 national organizations. They have created a tool called College Access Marketing (CAM) that assists groups in developing "communication to audiences that strongly influence students' choices and options (Audience Research, n.d.)." The online resource separates the campaign construction process into eight steps: define a purpose, identify target audience, set objectives, use research, marketing plan, implement plan, learn as you go and leave a legacy.

These aims seem to fit well with the goals of the access problem. However, the underlying theoretical model remains one of transmission. Social marketing is a more elaborate framework for getting the source's message effectively to a specified receiver or audience. The only thing that social marketing has added is the element of effective persuasion. "Social marketers turn to the people they target not to identify what ends or goals they should encourage but to find in what ways 'they must 'package' the social idea [or end they propose] in a manner which their target audiences find desirable and are willing to purchase (Kotler and Saltman, 1971, as cited in Brenkert, 2002, p. 18)." The message or behavior to be changed is still defined by the source with a disregard to the receiver or audience, the same problem that exists with the transmission model. While the stage of identifying the target audience may seem to be an attempt at understanding, its purpose is to match up the individuals that would most likely make the source's desired change. For instance, College Access Marketing (CAM) suggests using categories, such as demographics, geographic location, stage in the education process or attitudes and belief about school, to determine the people whose behavior has to change in order for the campaign to be effective (College Access Marketing, n.d.). Again, the CAM model is focused on accurately and effectively getting the source's message to the audience or receiver. This model also creates the same analytical question, whether the audience is receiving the correct message, using the same variables of analysis, demographics and descriptions of the audience and whether the desired action is taken.

This disregard for the audience creates issues that affect the ultimate outcome of the efforts. First, the audience is not given a voice in the sense of being accorded various participatory rights (Brenkert, 2002). Perhaps the audience does not feel that they have a problem in the first place. Understanding their perception of the situation or problem is necessary to create information and solutions that can actually be used by the audience.

Also, social marketing ignores the important aspect of the social context of the problem. Social conditions and structures, such as poverty, exist that may have a significant impact on why the problem exists. "This is not to say that they must themselves change background conditions or structures, but they must (at least) ascertain whether the actions they propose are undercut by those conditions and structures (p.20)." In this case, the amount of information individuals receive will not outweigh the existing social barriers to change. It would be more effective to first understand the context in which the social problem exists through affected individuals' perspective and then use that understanding to create information that responds to the actual problem. When the source defines the problem, as well as the message, there is a greater chance that the information will not fit with the audience's needs and will not be useful for the social problem in question.

New Models for Studying the Access Problem

All of these communication models concentrate the focus and the power in the source of the message. The source not only determines the message, but also defines the audience and uses that definition to create the message. This conception of

audience is not only problematic, but ineffective and results in the lack of intended changes in behavior. Currently, important variables for analyzing whether an individual participates in postsecondary education are demographic categories, like first generation status, income level, and race, and the level of information received and social supports, which are reflected by overall familiarity with postsecondary education. These variables produce a Demographics-Based model that ignores difference in decision making and how information is used in the process. There are other variables at play that go unnoticed in the current strategies and methodologies used to address the problem. These models cannot explain the dynamic process that occurs when people actually use information. They do not attend to the subjective process of constructing the message's meaning. However, these are the elements underlying differences in whether or not individuals change their behavior, in this case applying to college. Programs are needed that use a different theoretical model, one that provides a different conception of source, audience and information. Also, a different methodology for analysis is needed, one that moves beyond questions of whether the source's message was received by the audience.

The Convergence Model

Rogers and Kincaid (1981) present a convergence model of communication that attempts to move past the linear models (source-message-channel-receiver) and describe a more dynamic communication situation. As represented in Figure 3, there is no longer a source and receiver with one holding a larger share of power, instead there are two participants A & B. The model acknowledges the psychological process of

perceiving, interpreting, understanding and believing that is occurring. More importantly, the accuracy of understanding and belief is irrelevant. Because the model is not linear, but cyclical, the opportunity continually exists to attempt to gain mutual understanding (Windahl & Signitzer, 1992). This model is important because it not only changes the conception of source, audience and information, but it creates a different methodology for analysis. The variables of analysis are completely different. Using this model, one can examine the interpretation and perception of information, instead of the receipt of information.

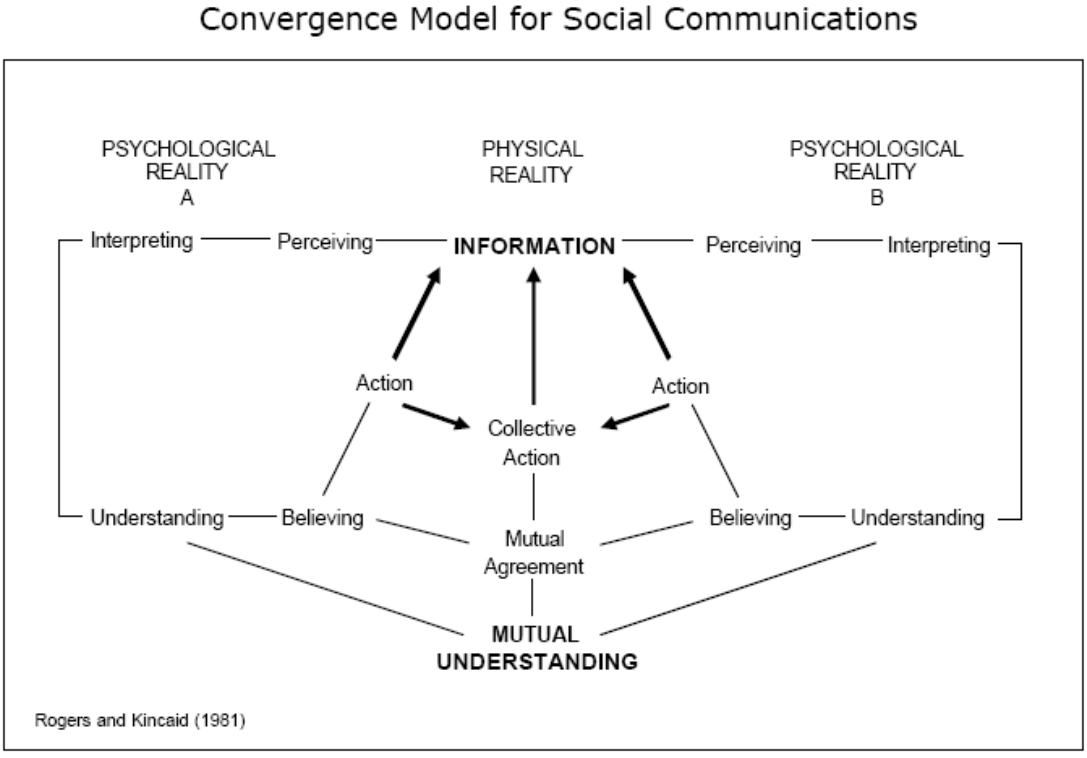


Figure 2: Kincaid's model of convergence communication (Rogers and Kincaid, 1981)

The Sense-Making Methodology

To create more effective access programs, the problem should be analyzed in a different way; one that focuses on redefining the audience and includes how these parents and students interpret and perceive the information given and make sense of it in their worlds. Brenda Dervin's Sense-Making model provides a set of methods to study human use of information, specifically how we use it to make sense in our everyday experiences.

In order to understand the Sense-Making model, some underlying assumptions about information and audience must be explained. First, it is a response to the traditional societal assumptions about information. Dervin explains that in our democratic society we hold the following premises:

- That access to 'good information' is critical for the working of 'good democracy';
- That when information is allowed to flow freely in a free marketplace, 'truth' or 'the best information' naturally surfaces much like cream in fresh milk;
- That the value of 'good information' is such that any rational person will seek it out and that, therefore, availability equals accessibility;
- That 'good information' ought to be available to all citizens in a democracy, that there should be no information inequities; and
- That it is unfortunate that some citizens have fewer resources, and that we must therefore provide means of access to 'good information' for these citizens (Dervin & Foreman-Wernet, 2003, p. 73).

These premises comprise the narrative of what information should be and how we should use it, especially for the purposes of facilitating democratic practice. It is easy to see that our society uses this narrative to shape its approach to higher education specifically. The aforementioned literature discussed has this narrative as its foundation. The current approach does not question the source's role in information

production, or the quality of the information itself. The definition of quality is accuracy from the source's point of view, the production of facts.

The main theoretical underpinning of the narrative is the presence of an understandable order; to society, but also to humans and their actions. These ideas are rooted in positivism, assuming that social phenomena are consistent enough to be studied methodologically and that study can produce theoretical models to describe the phenomena. Of course, positivism is relevant; otherwise there would be no need for this study. However, with regard to the study of communication and information, it leaves no room for inconsistencies in information's meaning or individual action. The main issue with the preceding premises is defining "good information". It is assumed that it is possible to define it and that "good information" is the same for all individuals. This would indicate that the information has a consistent, objective meaning. However, people attend to decision-making processes very differently and how information is interpreted in the process is not always constant. This concept, the assumption of discontinuity, indicates that information's meaning is not constant across individuals. Instead, the interpretation of meaning is socially constructed. An individual's experiences, circumstances and perspective can lead them to come to different conclusions, or create different meanings, about the same situation or information. Dervin (1989) suggests that "objectivity may be indirectly detrimental to effective communication. In their quest for objectivity, communicators strive to give facts, ignoring personal feelings and subjective information that may assist the receiver in understanding and using the message. An overly factual, neutral and depersonalized

message offers receivers few keys as to how to use the information in the context in which they find themselves. This perspective, to a large extent, supports an information-as-storytelling approach in which examples, metaphors, personalization, etc. add subjective cues to what is being told (Windahl & Signitzer, 1992, p. 143)."

This is not to say that there is no objective meaning to anything. Sense-Making also acknowledges that an orderly, objective meaning of reality exists. "The Sense-Making Methodology carefully articulates an alternative philosophical perspective that straddles the polarities of the modern and postmodern worldviews. Sense-Making assumes: 1) that both humans and reality are sometimes orderly and sometimes chaotic; 2) that there is a human need to create meaning, and knowledge is something that always is sought in mediation and contest; and 3) that there are human differences in experience and observation (Dervin & Foreman-Wernet, 2003, p.80)." In this way it is a critical theory that presumes that there is an objective reality and meaning, but for individuals, it is the subjective, socially constructed meaning upon which their actions are based. This assumption is well suited for examining college choice because it acknowledges that objective information exists, for example, the actual cost of tuition and fees for attending a college or university. However, what really matters in the choice process is an individual's interpretation of the information and the meaning or sense that is created by his or her individual perspective. Using the same example of tuition, two low-income students can receive the same objective information and the meaning created for one may be "I will have to apply for student loans." However, for

the other, it may be “higher education is not an option for me.” This distinction in meaning can be the difference in attending a college or university or not.

Understanding that a difference in meaning exists necessitates a different conception of audience. Instead of just being a receiver of information, the audience is creating the information’s meaning. The following assumptions describe a different conception of audience, one that active and empowered in the communication process.

- Sense-Making does not presuppose impacts of messages, but rather lets receivers define what impact messages have on them.
- Sense-Making sees characteristics of life contexts of receivers not as barriers to and mediators of messages, but rather as contexts within which receivers use messages to make sense of the world.
- Information is defined as that which informs from the receiver’s point of view. It is seen as the sense the receiver makes to bridge gaps in his or her world.
- Sense-Making is situational, predicted by situational conditions (Dervin, 1984)

The focus on the individual’s meaning of information seems problematic for large scale research; however, it really just changes the variables used to describe the audience. The Sense-Making model addresses the question of what predicts message use, which is central to the access problem. Current access research answers this question using traditional demographic categories: how much information about higher education is possessed and how much support is received from others. Analysis of these categories can only be used to give certain individuals more information or support. Those actions never addressed the actual intended effect of the information in the first place, whether or not they enroll in higher education. Dervin suggests that new categories be defined using people’s perceptions of certain situations and their resulting informational needs. Allowing the audience to describe their perception of the decision situation and what

they needed results in categories for analysis that can be used to adapt the information provided in order for it to be used more effectively. The categories also will be more effective in defining who does and does not enroll in higher education, as compared to the categories associated with the current models.

Model Definition

In the Sense-Making model, the analysis focuses on defining differences in message-making and message-using. It is assumed that the interpretation of the information received will cause gaps in the decision-making process. These gaps are created when an individual sees something missing in his or her sense (Dervin, 1992). The gaps or moments of discontinuity create the individual differences in message meaning and how information is used in the decision-making process. Defining the individual's sense making develops from how the individual perceived the gap and how they bridged or moved past the gap. The bridging process is explained by what was needed or used to make the decision, the barriers faced, and finally, the helps that were wanted for the decision-making. The interplay of the helps used, barriers and helps wanted describe the process of an individual taking in information and "making sense" of it in the decision situation. These differences in sense making will provide new, more useful categories to describe the audience, students and parents making decisions about obtaining a higher education. The resulting Sense-Making Model can be defined as:

Apply/Not apply = f (Situation movement, perception of information, type of helps used, type of barriers, type of helps wanted)

Situation movement describes how the individual progressed through the decision-making process, whether the individual became stopped in the process and his or her description of the stop. The different categories of stops are defined as seeing a number of options available, seeing an option but something or someone standing in the way, seeing no options available, seeing an option but as you moved through the decision-making process that option disappeared, or seeing your options as being forced upon you. These categories are adapted from a schema that was developed from previous qualitative and quantitative studies utilizing the Sense-Making model (Nilan, 1985; Dervin & Nilan,1999).

In addition to situation movement, it is necessary to examine the perception of the information that was used. What is desired is an understanding of whether the information received during the course of the decision facilitated the decision-making process of the individual. Taking the traditional or mechanistic approach to communication, it is assumed that all information is helpful or supportive to an individual's search process and that the decision-making process always benefits from additional information. The perception of information variable will capture the discontinuity of meaning and how the interpretation of information's message can negatively affect the ultimate decision. Categories of perception are defined as supportive, neutral, or hindering, using the findings of Frenette's study of anti-smoking messages and adolescents using the Sense-Making framework (1999).

Frenette found that adolescents processed the anti-smoking campaign messages differently based on their interpretation of the message in relation to their own

circumstances. When adolescents saw messages relating to personal experiences and current life situation and had no constraining conditions that caused them to be defensive, Frenette found that they used the information as a stepping stone in the decision to stop smoking. Similarly, when smokers viewed the messages as acknowledging needs satisfied by smoking, they were more inclined to listen to suggestions about alternative ways to meet those needs. In these cases the interpretation of the information's message was supportive. Alternatively, some respondents found the information's message hindering to their decision process. For example, this occurred when messages seemed oblivious to social dynamics surrounding smoking, or ambiguity of the message lead the smokers to focus on figuring out the message rather than how it related to them (Dervin & Foreman-Wernet, 2003). This study is concerned with a similar phenomenon, how the message from information regarding higher education may affect an individual's final decision of actual gaining a higher education. Taken together, situation movement and perception of information will represent a description of their discontinuity or gap definition.

After defining the gap, it is necessary to describe how the individual bridged that gap in order to move through their decision-making process. The bridging process will be defined by three variables: types of helps used, barriers faced, and types of helps wanted. The first, types of helps used, will describe the various resources the individual used during the decision-making process. While basic text information may seem the most appropriate resource, the term aims to capture other forms of help, such as guidance from a parent or input from a guidance counselor, which provide a social

support. Previous research has indicated the level of importance of these social forms of help is negatively correlated to income level and first generation status or parental education level, with those with lower income and education levels indicating a greater level of importance (Behrman, 1998; Cabrera & LaNasa, 2000; Hossler, Schmit, & Vesper, 1999; McDonough, 1997).

The remaining variables describing the bridging process will be the types of barriers the individuals faced during the process and the types of helps the individual would have wanted to have during the decision-making process. It is assumed that the differences in the barriers faced and types of helps wanted will follow the pattern of the types of helps used, with there being differences in the importance of social forms based on income and education level. The assimilation of all of the defined variables provides a model of the individual decision-making process that surpasses the traditional demographic descriptors, a Demographic-Based model of analysis, in explaining whether or not a person who aspires to gain a postsecondary education actually ends up applying. In other words, the differences in whether or not an individual applies to postsecondary institutions is a function of situation movement, perception of information, type of helps used, type of barriers, and type of helps wanted.

This chapter has outlined various lines of research and how they influence the research question at hand. The findings of the research on access and the college choice process has defined participation in higher education using the variables of demographics categories and level of information and support possessed by the

individual. These findings and variables have shaped the strategies utilized by current access programs to address the problem; however, the access problem persists. Communication theory provided insight into the problems with the current programs. The theoretical models currently used to create the information, as well as disseminate it, reinforce the categories that define the variables of analysis used in the afore-mentioned research. Alternative models of communication and analysis were presented that allow the opportunity to define new variables for analyzing the problem, variables that can be used to make changes to the information and to whom it is provided that will allow it to be used more effectively. The next chapter will define the variables that comprise the Demographics-Based and Sense-Making models and the methodology that will be used to study the specified research hypotheses.

CHAPTER THREE
METHODOLOGY

As previously discussed this study aimed to test a new audience-centered model of decision making that define new variables that affect the likelihood of students applying to postsecondary education. The benefit of the Sense-Making model is that the methodology focuses on allowing the audience to define the problems that occurred in the decision-making process. The resulting variables of the model actually define the differences in how information is used and how decisions are made, as opposed to what this study calls the Demographic-Based model where the variables define the differences in the individuals in the audience. The resulting significant variables in this analysis can be used to adapt the information produced by universities and public agencies and change the program strategies used to solve the problem of access.

Quantitative testing of the Sense-Making model

The Sense-Making model is generally a qualitative methodology. However, in order to compare it to the quantitative methodology of the Demographics-Based model, it is necessary to adapt the model and operationalize the model variables in more quantitative terms. And while the focus of the model is to gain more qualitative insights regarding information seeking and decision-making, Dervin has discussed the quantitative capabilities of the model. She has described different research scenarios, or exemplars, for which more quantitative analysis is appropriate (Nilan, 1985; Linderman, 1997; Frenette, 1999; Nelissen, P., Van Eden, D., & Maas, S., 1999; Nilan & Devin, 1999). Previous research also has shown conditions under which stable categories for certain

model variables are practical and provide the opportunity to create categories for closed-ended questions (Frenette, 1997; Nilan & Dervin, 1999). While the use of two close-ended questions for the variables situation movement and perception of information result in a loss in the richness of the responses, it is necessary in order to create a model that can be tested against the prevailing methodology which is quantitative in nature. Additionally, the quantification of the model allows for a larger sample size, again allowing comparison to the Demographic-Based model. The three remaining conceptual variables, helps used, barriers, and helps wanted, were measured using open-ended survey questions. The resulting responses were coded into quantifiable categories as appropriate.

Data Collection

In order to gather the data to analyze the Sense-Making model, it was necessary to interview individuals about their specific decision-making experience regarding obtaining a postsecondary education. In the interview situation, Dervin explains that "the respondent is asked to reconstruct a situation in terms of what happened in the situation. The core focus of the description is directed to …circling the micro-moment in terms of how the actor saw the situation, the gap, and the helps he or she wanted (1992, p. 72)." The survey instrument was designed to get the respondent to reflect on the decision process by defining the gap or discontinuity they experienced in the process and then describing how they moved past it. Respondents were asked a combination of closed-ended and open-ended questions (see Appendix B: Survey Text).

Data Source

A telephone survey of randomly selected Virginia residents was conducted to gather the data. With the small number of open-ended questions, a telephone survey was appropriate, allowing a larger sample size to be achieved, again to allow comparison to the Demographics-Based model. Dervin has noted the suitability stating that past studies have successfully utilized telephone interviews (1992).

The survey population was residents of the Commonwealth of Virginia. The Commonwealth was appropriate because Virginia's population is comparable to the nation overall based on a number of key study characteristics related to access. For example, thinking about the percentage of people who would have made the college choice decision, 35.5% of the population of Virginia aged 18 to 24 years is enrolled in college or graduate school, compared with 35.1% in the US overall (US Census, 2005). Also, 86.5% of Virginians aged 25 years and older have at least a high school diploma, qualifying them to be eligible to enter the postsecondary system. The national average is 86.8% of the population (US Census, 2006).

Since the study is focused on how low-income status affects the decision-making process, it is also important to understand the economic demographics of the survey population. In 2005, 31.7% of Virginia households made less than $35,000 per year, and 46.1% made less than $50,000 per year. That is comparable to the national statistic of 38.4% of households making less than $35,000 and 53.5% less than $50,000 (US Census, 2005). While reliable national and state level data on first generation status does not exist, data has been collected to determine the percentage of students who are lost

between high school graduation and enrollment in college. According to the Western Interstate Commission for Higher Education (WICHE) approximately 35% of students do not go on to higher education after graduation from high school in Virginia, compared with a national average of approximately 30%. Considering the important characteristics for the present study, having made the college choice decision, income status and having students who may have aspired to gain a higher education, but did not, gaining an understanding of Virginia's population provides insight to inform future national level studies.

Study Subjects

Analysis was limited to individuals having a recent personal experience, within the past five years, making the decision of whether or not to obtain a higher education. Those individuals may be traditional aged students or adult learners; no age related screening was used. To determine whether a respondent is appropriate for participation in the study, screening questions were used.[1] The study sample was comprised of three groups: two groups of adult respondents who report having considered whether or not to seek a higher education in the past five years, prospective traditional aged students and prospective adult learners, and those who report that a household member has considered seeking a higher education in the past five years and they were involved. The study sample provides examination of both types of students, traditional aged and adult. The age ranges for each were adjusted to reflect the fact that the consideration

[1] The initial respondent selection procedure for the sample will consist of asking for the youngest adult male who lives in the household who is currently at home at the time of the call. If no such adult male is currently at home, the interviewer will ask for the oldest adult female currently at home.

decision could have occurred within the previous five years. Therefore, the traditional aged student could be 18 to 29 years of age; and adult learners, 30 and above. The type of student was included in the model analysis to determine the effect on the decision to apply.

Previous research has chosen to study one particular type of student or the other and defined differences accordingly. The Sense-Making variables used in this study assume differences based on decision-making process and how information is used, rather than demographic-based differences like age. The findings from the study provide an understanding of both types of students, while still including the type of student variable to define its' effect. After confirming the respondent's qualifications for the study, he or she was asked a series of questions corresponding to the previously defined variables in the Sense-Making model.

Sense-Making Model Dependent Variable

This study is interested in defining what accounts for differences in whether or not students decide to apply to colleges and universities. Therefore, the dependent variable for the model was whether or not the respondent reports applying to postsecondary institutions.

As discussed in Chapter Two, the college choice decision is comprised of separate stages (Appendix A). This study is concerned with understanding the individuals that get lost in the search stage of the process and the role that information played in the process. After individuals gather information about obtaining a postsecondary education and specific colleges and universities, the first question with

which they are faced is whether or not to apply to institutions. The question of whether or not to attend a college or university was not chosen because that decision process involves the choice between a number of alternative institutions. At that point the choice variables relate to the fit between personal preferences and situations and individual institutions. Focusing on the decision to apply provides the opportunity to eliminate the role that cost or logistics may play and concentrate on information and how it was used in the decision.

Sense-Making Model Independent Variables

Situation Movement

To measure the conceptual variable situation movement a branching question was used, first asking the respondent if they experienced a difficulty moving forward in the decision-making process. If the respondent answered yes, then they were asked a closed-ended question with five response options describing the difficulty. These types of difficulties are based on prior studies utilizing the Sense-Making model which indicate that how the individual perceived moving through the decision process had an effect on the ultimate decision that was made (Nilan, 1985; Dervin & Nilan, 1999).

Table 2: Situation Movement Response Options

Situation Movement Response Options		
Control of choice	SMa	Seeing a number of options available
No control of choice	SMb	Seeing an option but something or someone standing in the way
	SMc	Seeing no options available
	SMd	Seeing an option but as you moved through the process it disappeared
	SMe	Seeing your options as being forced upon you
	SMf	No difficulties

If one considers how the difficulties could apply to the question at hand, they fall into two categories. Students who will eventually apply to postsecondary education

institutions ultimately will have to make a decision about which institutions they will choose. Therefore, seeing a number of options available could reflect the normal decision-making process where the individual still controls the choice of outcome. The rest of the difficulties indicate the individual having no control in the decision process, or the choice of the decision outcome being out of their control. Two operational dummy variables were created from these response options, control of choice (CO) and no control of choice (NC). Control of choice was present if a respondent indicated seeing a number of options available. No control of choice was present if a respondent indicated any of the other response options. Having no difficulties was represented by a zero value for both variables (Appendix C: Variable Definition Table). A hypothesis can be created based on the different types of difficulties indicated by the respondents.

Hypothesis 1
H_0: Respondents that indicate a difficulty that decreases their control over the choice will not be less likely to apply.

H_1: Respondents that indicate a difficulty that decreases their control over the choice will be less likely to apply.

Perception of Information

Again previous research has indicated stable categories to be used to measure the conceptual variable, perception of information (Frenette, 1997). The variable was measured by a closed-ended survey questions asking respondents to rate the information they used in the decision-making process as hindering, having no effect or being supportive. The variable was included in the model to test the assumption that information is generally supportive to the user and facilitates the decision-making process. This research suggests that information may have a negative effect or no effect

at all on the process. A dummy variable was created to represent the respondents who indicated information was hindering or had no effect on the decision process. A zero value for the dummy variable represented respondent who indicated information was supportive in the decision process.

Based on this understanding, the following hypothesis can be asserted:

Hypothesis 2:

H_0: Respondents that indicate information was not supportive to their process will not be less likely to apply.

H_1: Respondents that indicate information was not supportive to their process will be less likely to apply.

Helps Used, Barriers and Helps Wanted

The variables comprising the bridging process or how they moved through the decision process, the types of helps used, barriers and helps wanted, require opportunity for more input from the respondent. Those survey questions were posed to the respondents as open-ended.

The interviewer had a number of pre-determined categories to use to code the response, but the categories were not read to the respondent. The response options are based on prior research findings regarding the college choice decision and access (Cabrera & La Nasa, 2000; Flippen & Graham, 2005; Hossler and Gallagher, 1999; Long, 2004; McDonough, 1997; Sanoff, 2003; Venezia, Kirst & Antonio, 2003). For the variable helps used, the following categories will be provided: cost information, school reputation/ranking, availability of part-time status, admission requirements, information about the location, parents' opinion, perception of family and friends,

information about the sports program, information about the social life, input from a guidance counselor, financial aid assistance, and location. The following responses were provided for the barriers variable: trouble finding information, trouble completing the applications, trouble completing the financial aid forms, didn't have the grades or test scores, didn't have the money, needed a part-time program, not enough help from the guidance counselor, and no barriers. Finally, for the variable helps wanted, the following categories were provided: explanation of information, support from family, support from guidance counselor, having better grades/SATs, getting motivated, talking to others. Any remaining responses were entered verbatim by the interviewer. These remaining responses were then coded into an initial set of categories by the researcher.

After creating the initial categories, five consistent, broader categories were defined that applied to each of the three conceptual variables, helps used, barriers, helps wanted. The five categories are money, school characteristics, information support, social support and personal life characteristics. Based on the coding structure a number of operational variables can be defined: 1) whether the conceptual variable was used at all (i.e., used helps, had barriers, wanted helps); 2) whether a specific category type was used (i.e., used school characteristics, had a money barrier, etc.); and 3) the degree to which a specific category was used (i.e., used three types of information support, had two personal life characteristics as a barrier, etc.).

The first option, whether the conceptual variable was used at all, was not chosen because it lent little to interpretation compared to the other options. Two analyses were run using each of the remaining operational variables (types used or degree of

use). Both analyses resulted in the same categories being significant. Therefore, the type of category variable was chosen for the final analysis because it was easier to interpret for testing the hypotheses.

After defining the final categories for each of the variables the following hypotheses can be asserted:

Table 3: Hypotheses for Helps Used, Barriers and Helps Wanted

Variable	Hypothesis (#)
Helps Used	3. Respondents that indicate using financial assistance in the decision-making process will be less likely to apply. 4. Respondents that indicate using school characteristics in the decision-making process will be more likely to apply. 5. Respondents that indicate using informational supports in the decision-making process will be more likely to apply. 6. Respondents that indicate using social supports in the decision-making process will be more likely to apply. 7. Respondents that indicate using personal life characteristics in the decision-making process will be less likely to apply.
Barriers	8. Respondents that indicate money as a barrier to the decision-making process will be less likely to apply. 9. Respondents that indicate school characteristics as a barrier to the decision-making process will be less likely to apply. 10. Respondents that indicate informational supports as a barrier to the decision-making process will be less likely to apply. 11. Respondents that indicate social supports as a barrier to the decision-making process will be less likely to apply. 12. Respondents that indicate personal life characteristics as a barrier to the decision-making process will be less likely to apply.
Helps Wanted	13. Respondents that indicate wanting financial resources for the decision-making process will be less likely to apply. 14. Respondents that indicate wanting different school characteristics will be less likely to apply. 15. Respondents that indicate wanting informational supports will be less likely to apply. 16. Respondents that indicate wanting social supports will be less likely to apply. 17. Respondents that indicate wanting changes to personal life characteristics will be less likely to apply.

In order to determine the reliability of the coding by the researcher, a calculation of inter-rater reliability was performed for each of the types of helps used, barriers and helps wanted. The calculation was performed using a sample of the responses entered verbatim. Two additional raters coded the responses in the selected sample to ensure reliability, using the five categories defined for all three variables. The three sets of coding were compared to calculate the Kappa statistic to evaluate the level of agreement in the resulting coded data. Because the responses that are easiest to interpret were coded by the interviewer, it is assumed that the sample used to calculate inter-rater reliability is comprised of responses that are more difficult to code or interpret. Therefore, it is also assumed that the resulting kappa statistic will be higher.

Table 4: Inter-rater Reliability Results

Variable		Rater One	Rater Two
Helps Used	Money	1.00	*
	School Characteristics	0.73	0.80
	Informational Support	0.48	0.75
	Social Support	0.66	*
	Personal Life Characteristics	0.41	0.59
Barriers	Money	1.00	1.00
	School Characteristics	0.74	0.94
	Informational Support	**	0.79
	Social Support	0.72	0.72
	Personal Life Characteristics	0.70	0.75
Helps Wanted	Money	0.96	0.95
	School Characteristics	0.90	0.74
	Informational Support	0.88	0.71
	Social Support	0.73	0.85
	Personal Life Characteristics	0.83	0.83

* Rater coded no responses (difference = 1)
** Rater coded no responses (difference = 2)

All of the resulting kappa scores were statistically significant ($p \leq .05$).

Demographic-Based Model Independent Variables

As previously discussed, research has indicated that the amount of information and the social support an individual possesses regarding higher education, along with correlating demographic indicators (i.e., low-income, first-generation students and race) have a significant effect on whether or not an individual participates in postsecondary education. Both information and social support and capital serve to increase an individual's overall familiarity with postsecondary education. For this study, the level of information and social support was measured by the respondent's overall familiarity with postsecondary education. First, respondents were asked to rate their level of familiarity with a number of types of postsecondary institutions: public and private four-year universities, community colleges, technical colleges and online-degree programs, on a scale of one to ten. These five responses were aggregated to form an index of familiarity for each respondent, maintaining the one to ten scale.

Two other variables could have an effect on the decision process, the age of the respondent and whether the decision was being made for the individual or someone in their household. For each of these dummy variables can be created. For age, one represents 18-29 year olds and 0, 30 and over. For the type of decision, one represents making the decision for self, and 0, someone in the household. This process creates three groups, traditional aged students, adult learners and those who report that a household member has considered seeking a higher education in the past five years and they were involved. A variable representing each of these groups was included in the

Demographic-Based model as well. The demographic indicators, income status, first generation status and race were also included.

A table explaining the measurement of the dependent and each of the independent variables is included in Appendix C.

Statistical Analysis

This study is interested in defining new variables that contribute to the explanation of whether or not an individual applies to postsecondary institutions. The Demographics-Based variables have a significant effect, but do not fully explain the differences. The Sense-Making variables address the definition of differences in decision making and will contribute to the explanation of whether individuals apply. To determine the contribution of the proposed Sense-Making variables on the individual's likelihood of applying to postsecondary education a logistic regression was performed. Because the dependent variable of interest, whether or not an individual applies to postsecondary education, is dichotomous a binary logistic regression analysis was used. Only two variables, both in the Demographics-Based model, income and the familiarity index, are not dummy variables. In order to have the resulting regression coefficients of all the variables comparable, these two categorical variables were rescaled to have a range between 0 and 1. This allows the relative weight of each of the variables to be compared and assessed (Menard, 2002).

The analysis began with the Demographics-Based model variables and each of the Sense-Making variables was added to the logistic regression model to determine their significance and inclusion in the final equation.

Use of Stepwise Logistic Regression

Stepwise logistic regression includes and removes variables from the equation based on their statistical impact on the model. "Proponents of the use of stepwise procedures suggest that they may be useful in two contexts: purely predictive research and exploratory research. In purely predictive research, there is no concern with causality, only with identifying a model, including a set of predictors that provides accurate predictions of some phenomenon (Menard, 2002)." Since this research is concerned with identifying a new model, the stepwise function assists in isolating the variables that have the greatest influence on the dependent variable, namely predicting whether or not the respondent will apply to college. The variables included in the final equation are those that have a significant effect on the dependent variable and should be included in the model.

Because the conditions for a variable's inclusion are specified by the researcher, various authors have proposed relaxing the usual .05 criterion for significance, as it often excludes important variables from the model (Bendel and Afifi, 1977; Hosmer & Lemeshow, 1989; Menard, 2002). In order to determine if additional variables could be significant an additional stepwise logistic regression analysis was run using .10 as the cutoff for entry into the model and .15 as the cutoff for removal.

The stepwise logistic regression analysis produced a final model, defining the variables of the Demographics-Based and Sense-Making models that significantly affected the likelihood of applying to postsecondary education. The important contribution of the proposed model variables is that instead of merely focusing on the

level of transmission of the information, a greater understanding is gained of the utility of the message to individuals and where gaps in the decision process are occurring. Definition of these variables can then be used to shape information campaigns for individual universities and community colleges, as well as the reporting structures used by government agencies to inform the public.

The next chapter will present and discuss the descriptive analysis of the survey conducted. Next, the results of the stepwise logistic regression analysis will be provided and the final significant model variables will be discussed. The final chapter will place the study findings in the context of the current literature and provide recommendations for program change. The limitations of the study and directions for future research will also be discussed.

CHAPTER FOUR
DATA ANALYSIS

This chapter will outline the results of the survey conducted in May 2007 asking respondents to reflect on their decision to apply to postsecondary education. First, a descriptive analysis of the survey will be presented. Then the results of the binary logistic regression analysis testing the Demographic-Based and Sense-Making model will be presented and discussed. The analysis will determine which variables are influencing the likelihood of applying to postsecondary education.

Descriptive Analysis

The Sample

In order to select the appropriate sample, screening questions were used. First, respondents were asked, "In the past five years, have you considered whether or not to seek an education beyond high school?" Of the 806 respondents in the overall sample, 310 respondents answered yes. All respondents who answered no, 496, were then asked, "In the past five years, has anyone in your household considered whether or not to seek an education beyond high school?" Of those who were asked, 185 answered yes. Those 185 respondents were then asked if they were involved in the decision. Only those answering yes to both questions, the 138 respondents indicating they were involved in the decision, were included in the sample. This produced a final study sample of 448 respondents, with 75% indicating they were considering higher education for themselves and 25% indicating they were involved in the decision for a household member. Of that 25%, 19% were making the decision with a child, 4% with a spouse or partner, and 2% with some other household member.

Table 4: Final Study Sample by Decision Participation

FINAL STUDY SAMPLE BY DECISION PARTICIPATION[2,3] (N=448)			All adults[4]
	%	N	%
Respondent considered in past five years	75	310	44
Household member considered and respondent was involved in that decision	25	138	14
Child	19	112	11
Spouse/Partner	4	15	2
Other	2	11	1
Total	100	448	58

The study sample included respondents of all ages indicating they considered seeking a higher education, as long as the consideration was in the past five years. Therefore, the study sample can be broken into three categories, traditional aged students (aged 18-29), individuals participating in the decision with someone else, and adult learners (aged 30 and over). 27% of the sample was traditional aged and 47% were adult learners. The remaining 25% of the sample were involved in the decision for someone else.

Table 5: Study Groups

	%	N
Adult respondents who considered in past 5 yrs.	75	310
Traditional aged student (age 18-29)	27	86
Adult learner (30 and older)	47	212
No age response	2	12
Adult respondents who participated in decision with household member	25	138
Parent	19	110
Other relationship	6	26
No age response	0	2
Total	100	448

[2] Percentages may add to 99 or 101 due to rounding.
[3] Cells with zero percent contain cases, but the percentage is less than 0.5%.
[4] For data reporting sample counts are unweighted and percentages are weighted.

Applying to Schools

This study is interested in determining how differences in the decision-making process affect whether or not individuals participate in higher education. The decision to participate can be separated into two steps, deciding to apply to schools and, once admitted, deciding which school to attend. Respondents were first asked whether they attended a school. A large majority, 79%, said yes. The 21% that answered no or that they had not decided were asked if they had applied to schools. Of that group of 90 respondents, 22% said yes, they applied and 67% said no. Using these two questions, three groups can be created: those who attended, which represent 79% of the sample, those who applied, but did not attend, with 5%, and those who did not apply, with 14%. The focus of this study is on the decision to apply.

Table 6: Summary Table: Decision to Apply

	%	N
Attended	79	358
Applied, did not attend	5	18
Did Not Apply	14	60
Haven't decided yet	2	12
DK/NA	0	0
	100	448

Demographic-Based Variables

The demographic variables of race, income and first generation college student status were also measured. The majority of the sample, 69%, was White, while 28% represented racial minorities. In total, 21% was African-American, 2% was Asian, and 5% was some other racial category. Addressing income level, the largest percentage of

the sample, 41%, had a family income of $70,000 or above in 2006. Twenty-seven percent had incomes between $35,000 and $69,999 and 15% made under $35,000 in 2006. Respondents were also asked whether the decision was for a first generation college student. Thirty-nine percent of the sample indicated that the decision was for a first generation student.

Table 7: Racial Frequencies

	%	N
White	69	340
African-American	21	67
Asian	2	5
Other	5	22
DK/Refused	3	14
Total	100	448

Table 8: Income Frequencies

	%	N
Under $20,000	6	23
$20,000-$34,999	9	34
$35,000-$49,999	14	61
$50,000-$69,999	13	63
$70,000 and above	41	196
DK/Refused	17	71
Total	100	448

Table 9: First Generation Status Frequencies

	%	N
Yes	39	170
No	61	276
DK/NA	0	2
	100	448

The level of familiarity with higher education that an individual possesses has also been an important indicator of participation in previous research. To measure familiarity for this study, respondents were asked to rate their level of familiarity with various postsecondary institutions, on a scale of one to ten, with ten being completely familiar. They were asked about five different types of postsecondary institutions: four-year public colleges and universities, four-year private colleges and universities, community colleges, technical schools, and online degree programs. Respondents were most familiar with four-year public universities, with the mean rating being 7.2. They were slightly less familiar with community colleges, with the mean rating being 6.6. Respondents indicated an average level of familiarity with private colleges and universities. The mean rating was 5.7. And they were least familiar with specialty technical colleges and online degree programs, both receiving a mean rating of 4.2. [5]

Table 10: Mean Rating of Familiarity

Summary table	Mean rating of familiarity
Four-year public universities	7.2
Four-year private universities	5.7
Community Colleges	6.6
Specialty technical colleges	4.2
On-line degree programs	4.2

The five individual ratings were aggregated to create an index of familiarity, maintaining the scale of one to ten, with ten being completely familiar. Once aggregated, the sample had an average level of familiarity with higher education, with

[5] Frequency results for each of the five institution types can be found in the descriptive statistics in Appendix D.

the mean score for the index being 5.4. For ease of interpretation the index scale of one to ten was broken into three categories, low, medium and high. The low category was comprised of the index scores between one and three; medium, four to seven; and high, eight to ten. Consistent with the mean score, the majority of the sample, 56%, indicated a medium level of familiarity. Approximately the same percentage indicated a low and high level of familiarity, 23% and 22% respectively. Overall, familiarity with higher education was evenly distributed for the sample.

Table 11: Familiarity Index Frequencies

Familiarity index	
	%
Low	23
Medium	56
High	22
Mean	5.4

Sense-Making Variables

Questions were also asked to measure the five conceptual variables of the Sense-Making model: situation movement, perception of information, helps used in the process, barriers to the process, and helps wanted.

Situation Movement

To measure the conceptual variable situation movement a branching question was used, first asking the respondent if they experienced difficulty moving forward in the decision-making process. Sixty-eight (68%) of the respondents indicated having no difficulty, while 30% did. The 30% of respondents answering yes were then asked a closed-ended question with five response options describing the difficulty. These types

of difficulties are based on prior studies utilizing the Sense-Making model which indicate that how the individual perceived moving through the decision process had an effect on the ultimate decision that was made (Nilan, 1985; Dervin & Nilan, 1999).

Table 12: Summary of Situation Movement Variable

	%[6]	N
Had difficulty moving forward (Yes in Q5)	30	132
Seeing a number of options available	7	29
Seeing an option but something or someone standing in the way	9	38
Seeing no options available	1	6
Seeing an option but as you moved through the decision-making process that option disappeared	7	28
Seeing your options as being forced upon you	3	14
DK/NA type of difficulty (DK in Q6)	4	17
No difficulties (No in Q5)	68	311
DK if difficulty (DK in Q5)	2	5
Total	100	448

The largest percentage of respondents, 30% of those indicating difficulty (or 9% of the entire sample), said they saw an option but there was something or someone standing in the way. "Seeing a number of options available" and "seeing an option but as you moved through the process that option disappeared" had basically the same percentages, with 22% of those indicating difficulty or 7% of the sample. Finally, 10% of those indicating a difficulty or 3% of the sample indicated seeing their options as being forced upon them and 5% of those indicating a difficulty or 1% of the sample indicated seeing no options available.

[6] Percentages may add to 99 or 101 due to rounding.

Table 13: Description of Difficulties

	% asked (had difficulty)[7]	N
Seeing a number of options available	21	29
Seeing an option but something or someone standing in the way	30	38
Seeing no options available	5	6
Seeing an option but as you moved through the decision-making process that option disappeared	22	28
Seeing your options as being forced upon you	10	14
DK/NA	12	17
Total	100	132*

*132 respondents (those answering Yes to Q5) were asked question

If one considers how the difficulties could apply to the question at hand, they fall into two categories. Students who will eventually apply to higher education institutions ultimately will have to make a decision about which institutions they will choose. Therefore, seeing a number of options available could reflect the normal decision-making process where the individual still controls the choice of outcome. However, the rest of the difficulties indicate the individual having no control in the decision process, or the choice of the decision outcome being out of their control. The respondents can be grouped into three categories, those who had no difficulties, those who had a difficulty where they had control of the choice, and those who had a difficulty where they had no control of the choice. Control of choice is present if a respondent indicated seeing a number of options available (Table 14). No control of choice is present if a

[7] Percentages may add to 99 or 101 due to rounding.

respondent indicated any of the other responses. Having no difficulties is represented by a zero value for each of the variables.

Table 14: Situation Movement Response Options

Situation Movement Response Options		
Control of Choice	SMa	Seeing a number of options available
No Control of Choice	SMb	Seeing an option but something or someone standing in the way
	SMc	Seeing no options available
	SMd	Seeing an option but as you moved through the process it disappeared
	SMe	Seeing your options as being forced upon you

After grouping the response options based on control of the choice, one in five, or 20% of the study sample indicated a difficulty where they had no control over the outcome of the decision they were making. This lack of control is an important distinction to make because it would mean that the individual is unable to choose their preferred option and would be more likely to stop the process all together, meaning for this study, not applying to postsecondary education.

Table 15: Control of Decision Outcome

	% asked (had difficulty)[8]	Sample %
Control of Choice	21	7
No Control of Choice	67	20
DK/NA	12	4
Total	100	30

Perception of Information

Respondents were also asked to rate the information they used in the decision-making process, indicating whether they felt the information was supportive, hindering

[8] Percentages may add to 99 or 101 due to rounding.

or had no effect. This is an important distinction because it is generally assumed that information facilitates or supports the decision-making process. This assumption is the basis for the program strategy of providing a greater amount of information to parents and students. However, as previously discussed in Chapter 2, information may not support the decision process; instead it may actually hinder the process or have no effect because it was not useful. Proving this distinction would indicate that providing more of the same information is not effective in assisting individuals in making the decision to choose higher education.

A majority of the sample, 68%, indicated that the information they used was supportive to their decision process. However, more than one in four, 28%, indicated that information was hindering or had no effect. In other words, it did not serve the intended purpose.

Table 16: Perception of Information

	%
Supportive	68
Neutral	16
Hindering	12
DK/NA	3

Respondent's Description of the Decision Process

The next three variables represent the respondent's description of the decision-making process: the helps they used in the process, the barriers, and the helps they wanted. In order to gain qualitative insight and allow the respondent to define the categories, open-ended questions were used. The respondents' answers were analyzed and coded into categories that were created to group similar responses. Respondents

were allowed to provide multiple responses for the question. Therefore, the percentages indicated represent the number of respondents providing the particular response and may add to more than 100%.

Helps Used in the Process

The first variable is helps used. Respondents were asked what they used or needed in the decision-making process. It was assumed that information would not be the only thing used to make the decision. The word "help" was used to encourage respondents to include all the influences on their decision process.

Eleven response categories were pre-coded for the interviewer, but not read to the respondent. These pre-coded categories have been previously cited in the literature on the access issue. Most of the categories with the highest percentages were the pre-coded ones that reinforce findings for previous literature. The most frequently cited help was cost information, with 41% of respondents indicating it, followed by location, with 33%. A number of studies, particularly those focusing on the economic model of decision making, have found that these two factors are the most influential in the decision process (Manski & Wise, 1983; Hoxby, 1999; Long, 2004). Additionally, a number of studies have indicated the importance of location in alleviating cost, allowing students to live at home while attending (Angel & Barrera, 1991; Absher & Crawford, 1996; Griffith & Connor, 1994; Terenzini, et al., 2001).

One category that received a substantial percentage was "degrees or programs offered and curriculum requirements," which was cited by 18% of the sample. The category was not pre-coded, but created based on responses. School reputation or

ranking and financial assistance followed closely, with 16% and 13% respectively, indicating using it in the process.

Table 17: Helps Used Response Categories

Pre-coded responses	Yes[9]	No	DK/NA
	%	%	%
Cost information	41	55	4
Location	33	63	4
School reputation/ranking	16	80	4
Financial assistance	13	83	4
Perception of family and friends	8	88	4
Availability of part-time status	6	90	4
Admission requirements	5	91	4
Input from guidance counselor	4	92	4
Parent's opinion	3	93	4
Information about social life	2	94	4
Information about sports program	1	95	4
Other	33	63	4

Other Verbatim Responses	%
Degrees/programs offered and curriculum requirements	18
Online information	8
Career and income opportunities post-graduation	4
Print information	4
Flexibility in scheduling	3
Student's career aspirations	2
Time	2
Campus visit	1
Campus safety	1
Transferability of credits	1
Advising services	1
Child care	1
Unclassified	15

In order to facilitate interpretation after the initial coding process, broader categories or types, were created to aggregate the more specific categories. These

[9] Multiple responses allowed- percentages represent number of respondents providing particular response.

broad types were consistent for all three of the variables describing the decision process: helps used, barriers and helps wanted. The five categories or types are money, school characteristics, informational support, social support and personal life characteristics.

Table 18: Types of Helps Used

Type of Helps Used	Initial category
Money	Financial assistance
School Characteristics	Location Availability of part-time status Admission requirements Degrees/programs offered and curriculum requirements Flexibility in scheduling Campus safety Transferability of credits
Informational Support	Cost information Information about social life Information about sports program Online information Print information School reputation/ranking Campus visit Input from guidance counselor Career and income opportunities post-graduation
Social Support	Perception of family and friends Parent's opinion Advising services
Personal life	Student's career aspirations Time Child care
Other	Other

After aggregating the categories, the most often used type of help is informational support, with 62% of respondents indicating it. School characteristics were also very important, with half of the respondents, 50%, indicating they used them in the decision process. These findings are not surprising based on the existing

literature (Manski & Wise, 1983; Hoxby, 1999; Long, 2004). The prevailing definition of the decision-making process, a rational one, focuses on using information to understand the alternatives available and then choosing the alternative that best fits with the individual. So the individual would use information to understand the different school characteristics in order to make their decision, which school provides the best fit. These findings suggest that a large percentage of the sample is using, or attempting to use, this rational decision model.

The rest of the types of helps were less frequently indicated, with 13% using financial assistance and 10% using social support. It is interesting to see that such a small percentage indicated using social support. Much of the current college choice and access literature focuses on the effects of social factors on the decision process (Hossler & Gallagher, 1987; Kotler & Fox, 1985; McDonough, 1999). However, the small percentage noted here may indicate that the social support is not available, which has been previously correlated with not participating in higher education. This relationship will be explored in the next section of the analysis.

Table 19: Types of Helps Used Frequencies

Types of Helps Used[10]	%
Informational support	62
School characteristics	50
Other	15
Money	13
Social support	10
Personal life characteristics	4

[10] Multiple responses allowed- percentages represent number of respondents providing particular response.

Barriers

Respondents were also asked about the barriers they faced in the decision-making process. Again, the interviewer was provided seven pre-coded categories based on previous literature, that were not read to the respondents. The pre-coded categories are listed in the table below. Responses designated as "other" by the interviewer were recorded verbatim and coded later by the researcher. These categories are listed in the second table.

Table 20: Barriers Response Categories

Pre-coded responses	Yes	No	DK/NA
	%[11]	%	%
Didn't have the money, costs	25	71	4
Trouble finding information	7	90	4
Needed a part-time program	5	91	4
Trouble completing the financial aid forms	4	92	4
Didn't have the grades or test scores	4	93	4
Trouble completing the applications	3	94	4
Not enough help from guidance counselor	2	94	4
No barriers	23	73	4
Other	28	68	4

Other Verbatim Responses	%
Time	9
Hesitation re-choosing right school or major	8
Family obligations	8
Location	5
Work obligations	4
Didn't offer courses or program	3
Acceptance by school(s)	2
Student disagrees with parent	1
Travel, transportation	1
Motivation	1
Personal circumstances	1
Friends	1
Unclassified	4

[11] Multiple responses allowed- percentages represent number of respondents providing particular response.

The most frequently cited barrier was money, with 25% of the respondents indicating it. Time was cited by 9% of respondents and family obligations and hesitation about choosing a major or school was cited by 8%. Seven percent of the respondents indicated having trouble finding information. Again, all of the categories were grouped into the five types discussed previously. The following table outlines the type definitions.

Table 21: Types of Barriers

Type of barrier	Initial Categories
Money	Didn't have the money
School Characteristics	Needed a part-time program
	Didn't have the grades or test scores
	Location
	Didn't offer courses or program
	Acceptance by school
Informational Support	Trouble finding information
	Trouble completing financial aid forms
	Trouble completing applications
	Not enough help from guidance counselor
Social Support	Student disagrees with parent
	Motivation
	Friends
Personal Life	Time
	Family obligations
	Work obligations
	Travel or transportation
	Personal circumstances
	Hesitation regarding choosing school or major
Other	

After grouping the categories into types of barriers, the distinctions between the barriers are clearer. Personal life characteristics proved to be the greatest barrier with 29% of respondents indicating it. Many of the categories within this type, such as work or family obligations, or time, are not easily solved through program strategies. However, one category, hesitation regarding choosing a school or major, could be

addressed. This category was included with personal life characteristics because the choice involves fitting one's personal characteristics and desires with the school or major. The responses indicated the individual wanting to make the "right" choice, which relates to deciding which school or program will fit best. Respondents noted the problem of "picking out the right school" or "finding the right programs." There were also issues about knowing which major would serve their desired purposes, such as providing income. One respondent explained the problem of "deciding what degrees were better for her to find a job after putting herself into all of that debt."

Traditionally, the rational decision-making process is defined as knowing one's needs, researching alternatives, and based on the characteristics of the alternatives, choosing the one that fits best with the needs defined. However, as discussed in Chapter 2, many people do not use that rational process to make decisions. Individuals have problems defining their own needs as well as knowing the characteristics, or even knowing all of the alternatives available.

Respondents also indicated money as a barrier, with 25%. This finding fits well with previous literature. Numerous studies have documented the fact that the cost of postsecondary education is increasing steadily, while financial assistance is not keeping pace (Akerhielm, A., et al., 1998; Cabrera, A. F., & La Nasa, S. M., 2000; Ficklen, E. & Stone, J. E., 2002; National Center for Education Statistics, 2003).

School characteristics were a barrier for 17% of respondents. Looking at the categories that define school characteristics, three of them: needing a part-time program, location and not offering a course or program, indicate a problem with fitting

the school with the needs of the student. In these cases, the respondents know their needs and are not able to find the right alternative to fit with them. An underlying issue could be individuals not knowing all of the alternatives available to them. Referring back to the familiarity level with higher education, overall, respondents had a low level of knowledge about online degree programs, which could address these barriers, location, part-time programs and availability of majors. This fact provides an opportunity to increase awareness of these alternatives in order to increase participation.

Informational support was indicated as a barrier by 13% of respondents. These barriers indicate a problem with finding and using the information that is generally provided, such as financial aid forms and applications. While a majority of the respondents, 62%, indicated using informational support to help them make a decision, this finding shows that information may not always be a support in the decision-making process.

Interestingly, only 3% noted social support as a barrier. Much of the focus of access literature is on the lack of social support and it's linkage to lack of participation. Therefore, it was assumed that it would represent a larger percentage of the barriers. To address this point, the next section of the study will analyze the effect that social support has on whether or not the respondent applies to postsecondary education.

Table 22: Types of Barriers Frequencies

Types of Barriers[12]	%
Personal life characteristics	29
Money	25
School characteristics	17
Informational support	13
Other	4
Social support	3

Helps Wanted

Finally, respondents were asked what would have helped in the decision-making process. Again, the interviewer was provided seven pre-coded categories, based on previous literature, which were not read to the respondents. The pre-coded categories are listed in the table below. Responses designated as "other" by the interviewer were recorded verbatim and coded later by the researcher. These categories are listed in the second table.

[12] Multiple responses allowed- percentages represent number of respondents providing particular response.

Table 23: Helps Wanted Response Categories

Pre-coded responses	Yes	No	DK/NA
	%[13]	%	%
Explanation of information	13	77	10
Support from school/guidance counselor	8	83	9
Talking to others	7	83	9
Support from family	4	86	9
Getting motivated	4	87	9
Having better grades/SATs	1	89	9
Other	31	60	9

Other Verbatim Responses	%
Having more money	18
More/better information	11
Flexibility in scheduling	4
Remove family obligations	3
Ability to talk with someone at the school	3
Time	2
Remove work commitments	2
Visited schools	2
Closer proximity	1
Different curriculum or program	1
Change personal circumstances	1
Unclassified	6

Money, or wanting more of it, was the most often cited, with 18% of respondents indicating it. This is consistent with current literature that has noted the increasing costs of higher education making it more difficult for individuals to afford participation (Akerhielm, A., et al., 1998; Cabrera, A. F., & La Nasa, S. M., 2000; Ficklen, E. & Stone, J. E., 2002; National Center for Education Statistics, 2003).

There were a number of categories that related to information sources. Respondents indicated wanting an explanation of information and more or better

[13] Multiple responses allowed- percentages represent number of respondents providing particular response.

information, 13% and 11% respectively. While some respondents just indicated wanting more information, some were specific about what kind of information they needed to make a decision. Some respondents expressed a need for a more accessible format, suggesting an "easier online format." Some respondents were specific about the topic they needed. For example, wanting "more knowledge about online programs" or "up-to-date websites about what the schools are looking for in their admissions process." Other respondents indicated the need for a type of one-stop shopping information source, wanting "better search engines, a national database with selectable criteria that serves all schools, even small schools" or a "centralized information source that is in-depth."

Also, 8% of respondents wanted support from the school or their guidance counselor and 3% wanted the ability to talk with someone at the school. This need for personal interaction indicates an inability to effectively use the information sources available. For example, one respondent indicated wanting someone "to tell you who to talk to. Websites don't tell you who to talk to." These findings further augment previous responses about the shortcomings of the information available.

Again, all of the categories were grouped into the five types discussed previously. The following table outlines the type definitions.

Table 24: Types of Helps Wanted

Types of Helps Wanted	Initial Categories
Money	Having more money
School Characteristics	Having better grades/SATs
	Flexibility in scheduling
	Closer proximity
	Different curriculum or program
Informational Support	Explanation of information
	Support from school/guidance counselor
	More/better information
	Ability to talk with someone at the school
	Visited schools
Social Support	Talking to others
	Support from family
	Getting motivated
Personal Life	Time
	Remove family obligations
	Remove work obligations
	Change personal circumstances
Other	

After aggregating the categories, informational support was the most often cited, with 30% of respondents indicating it. As discussed above this indicates difficulty with effectively utilizing the information sources that are already available. Fourteen percent of respondents indicated wanting social support for the decision process. This finding is consistent with the existing literature which indicates that social support is strongly linked to the decision to participate in higher education.

Wanting different personal life and school characteristics were noted. Eight percent of respondents wanted to change some aspect of their personal life to assist them with their decision and 6% wanted to change something about the school(s) in order to assist them.

Table 25: Types of Helps Wanted Frequencies

Types of Helps Wanted[14]	%
Informational support	30
Money	18
Social support	14
Personal life characteristics	8
School characteristics	6
Other	6

Conclusions

Throughout the section findings have indicated the shortcomings of information sources regarding postsecondary education. More than one in four respondents, 28%, saw the information they used as having no effect or hindering their decision process. Informational support was seen as a barrier to the decision-making process by 13% of the respondents. They indicated problems with finding and using the information that is generally provided and necessary, such as financial aid and applications. And finally, 30% of respondents indicated wanting informational support for their decision process. Some wanted more or better information or an explanation of the information. Some respondents wanted personal interaction to assist with using information effectively and making the decision.

While it seemed that most of the respondents were attempting to use a rational decision making model, relying heavily on information sources, 62%, and school characteristics, 50%, to make their decision, there were a number of findings that indicated that process may not be working. First are the problems noted above with

[14] Multiple responses allowed- percentages represent number of respondents providing particular response.

utilizing information. Also, school characteristics were indicated as a barrier for 17% of the respondents. The specific responses indicated a problem with finding a fit between personal needs or desires and the characteristics of the school. Finally, 14% of respondents indicated wanting more social support for the decision process. This suggests that the individual needs assistance, like talking to others and support from family and friends, to navigate the decision process.

Focusing on adjusting the information in the process could address the problems found here. First, information must be more useable to individuals, without the help of a mentor or advisor. Also, individuals need to be aware of all of the school alternatives that are available in order to find the right fit. These goals could be reached by having entities that produce the information, government agencies, non-profit organizations and the schools themselves, defining the needs or desires of the population they are trying to reach by including them in the information creation process and increasing promotion and marketing campaigns for less used alternatives, such as online programs.

The next section of analysis will focus on determining the effect each of the previously discussed variables has on the decision to apply to postsecondary education using logistic regression. The purpose is to calculate which variables have the greatest influence on the decision and to use this understanding to modify the approaches currently used to address the access issue.

Model Testing

Statistics for Evaluating the Model

Goodness of Fit Testing

The -2 Log Likelihood and corresponding chi-square statistic will be used to assess the goodness of fit for the model as each additional variable is added. The difference between two log likelihoods multiplied by -2, or -2 Log Likelihood (-2LL), can be interpreted as a chi-square statistic if they come from two different models, one of which is nested in the other (McCullagh & Nelder, 1989). In other words if the predictors of the first model form a subset of predictors in the second model, the model chi-square calculated from the -2 Log Likelihood (-2LL) can be interpreted as the difference between a first model that contains only an intercept and a second that contains the intercept plus additional predictors. If the model chi-square is statistically significant ($p \leq .05$), then we conclude that the additional independent variables allow us to make better predictions of P(Y=h) (where h is some specific value for the dependent variable) (Menard, 2002).

Tests of Individual Variables

In order to test whether an individual variable is significant to the overall model, the Wald statistic will be used. The Wald test is a function of the logistic regression coefficient divided by its standard error. A significant result indicates that the variable is reliably associated with the outcome (Tabachnick & Fidell, 2001).

The odds ratio will be used to assess the effect of each variable in relation to the other variables. The odds ratio ($Exp\beta$) is the increase or decrease in the odds of being in

the outcome category when the value of the independent variable increases by one unit (Tabachnick & Fidell, 2001; Menard, 2002). An Expβ value that is greater than one indicates an increase in the odds of applying with a one unit increase in the specific independent variable; while a value less than one indicates a decrease. In order to calculate the odds percentage for a value less than one, the odds ratio must be subtracted from one (1- Expβ); the larger the percentage of odds, the greater the influence of the variable.

Statistical Analysis and Interpretation

Demographics-Based Model

The Demographics-Based model (D-B model) served as the initial model for evaluation. After the initial logistic regression analysis was performed with the D-B model, each of the variables in the Sense-Making model was added to the model and another stepwise logistic regression analysis was performed. After a new variable or set of variables is introduced, a significant decrease in the -2 Log Likelihood value from the value provided by the D-B model indicates a significant increase in predictive power. The logistic regression equation for the D-B model is:

$$App = \beta_0 + \beta_1 FG + \beta_2 I + \beta_3 R + \beta_4 FI + \beta_5 TS + \beta_6 D + \beta_7 AL$$

Where FG represents first generation status, I represents income level, R represents race, and FI represents familiarity level with higher education. The remaining three variables describe the individual responding, with TS representing a traditional aged student (ages 18-29), D representing making the decision for yourself or with someone in the household and AL representing an adult learner (ages 30 and over).

Table 26: D-B Model Classification Table

Observed		Predicted		
		Did you apply to schools?		Percentage Correct
		No	Yes	
Step 1	Did you apply to schools? No	5	54	7.9
	Yes	2	351	99.3
	Overall Percentage			86.3

The D-B model provided an improvement in classification. The intercept only model correctly identified all of those who applied, 354, and none of those who didn't, for an overall percentage of 85.7%. Using the variables in the D-B model, overall classification improved to 86.3% with 7.9% of those who did not apply being predicted.

Table 27: D-B Model Goodness of Fit

-2 Log Likelihood	Chi-Square	df	Sig.
303.634	34.641	7	.000

Compared to the intercept-only model, the reduction in the -2 LL (34.641) indicates that the addition of the D-B model variables is significant at the 95 percent confidence level (p= .000).

Table 28: D-B Model Variables in the Equation

Variable		β	Expβ	S.E.	Wald	Sig.
Constant	β_0	-.168	.845	.346	.236	.627
First generation	FG	-.551	.577	.299	3.399	.065
Income level	I	1.510	4.527	.577	6.843	.009
Familiarity index	FI	3.016	20.409	.779	15.003	.000
Race	R	-.168	.845	.346	.236	.627
Traditional age	TS	-18.793	.000	19823.344	.000	.999
Decision type	D	18.865	1.56E+08	19823.344	.000	.999
Adult Learner	AL	-.19.052	.000	19823.344	.000	.999

While the overall D-B model is significant, not all of the model variables are. The familiarity index is the most influential of the variables, with an odds ratio of 20.409. This indicates that for each increase in level of familiarity, respondents are 20 times more likely to apply. The original familiarity scale was one to ten, with a ten being completely familiar. As expected, income was also significant. While not as powerful as the familiarity index, with each increase in income category, the respondent was over four times more likely to apply (odds ratio= 4.527). First generation status was also significant. When the decision was for first generation students, they were 43% less likely to apply than those who are not (odds ratio= .577).

It is also important to discuss the variables that were not significant to the model. Race did not a have significant effect on the decision. Also, whether the individual was a traditional aged student (age 18-29) or whether they were an adult learner (age 30 and above) was not significant. This means that the rate of applying was not significantly different for those who were in the traditional age category than for those in the adult learner category. Finally, whether the respondent was making the

decision for themselves or along with a household member was not significant to whether the individual applied.

The analysis of the D-B model served as the baseline for determining the significance and additional predictive influence of each of the Sense-Making variables. These variables were grouped by the five conceptual variables, situation movement, perception of information, helps used, barriers and helps wanted, and added to the analysis individually.

Situation Movement Variables

The first Sense-Making variable to be added was situation movement. To measure the conceptual variable situation movement a branching question was used, first asking the respondent if they experienced difficulty moving forward in the decision-making process. If the respondent answered yes, then they were asked a closed-ended question with five response options describing the difficulty. These types of difficulties were based on prior studies utilizing the Sense-Making model which indicate that how the individual perceived moving through the decision process had an effect on the ultimate decision that was made (Nilan, 1985; Dervin & Nilan, 1999).

Table 29: Situation Movement Response Options

Situation Movement Response Options		
Control of Choice	SMa	Seeing a number of options available
No Control of Choice	SMb	Seeing an option but something or someone standing in the way
	SMc	Seeing no options available
	SMd	Seeing an option but as you moved through the process it disappeared
	SMe	Seeing your options as being forced upon you

If one considers how the difficulties could apply to the question at hand, they fall into two categories. Students who will eventually apply to higher education institutions ultimately will have to make a decision about which institutions they will choose. Therefore, seeing a number of options available could reflect the normal decision-making process where the individual still controls the choice of outcome. The rest of the difficulties indicate the individual having no control in the process, or the ultimate decision outcome being out of their control. Two operational dummy variables were created from the set of response options, control of choice (CO) and no control of choice (NC). Control of choice was present if a respondent indicated seeing a number of options available. The variable no control of choice was present if a respondent indicated any of the other response categories. Indicating no difficulties was represented by a value of zero for both variables (Appendix C Variable Definition Table).

A hypothesis can be created based on the different types of difficulties indicated by the respondents.

Hypothesis 1

H_0: Respondents that indicate a difficulty that decreases their control over the choice will not be less likely to apply.

H_1: Respondents that indicate a difficulty that decreases their control over the choice will be less likely to apply.

Adding situation movement to the demographics-based model resulted in the following logistic regression equation:

$$App = \beta_0 + \beta_1 FG + \beta_2 I + \beta_3 R + \beta_4 FI + \beta_5 TS + \beta_6 D + \beta_7 AL + \beta_8 CO + \beta_9 NC$$

Where variables FG through AL represent the demographic-based model and CO represents having control of the decision choice and NC, no control.

Table 30: Block 2 Classification Table

			Predicted		
			Did you apply to schools?		Percentage Correct
	Observed		No	Yes	
Step 1	Did you apply to schools?	No	8	50	14.3
		Yes	5	349	98.7
	Overall Percentage				86.6

The addition of the situation movement variables made little contribution to the predictive power of the overall model, with the overall model percentage decreasing from 86.3% to 86.6%. However, the percentage of those not applying increased from 7.9% to 14.3%.

Table 31: Block 2 Goodness of Fit

-2 Log Likelihood	Chi-Square	df	Sig.
292.707	45.568	8	.000

The addition of the situation movement variables did significantly reduce the -2 LL of the overall model at the 95 confidence level (p= .000).

Table 32: Block 2 Variables in the Equation

Variable		β	Expβ	S.E.	Wald	Sig.
Constant	β_0	-.155	.872	.351	.152	.697
First generation	FG	-.489	.613	.304	2.587	.108
Income level	I	1.317	3.733	.582	5.125	.024
Familiarity index	FI	3.271	26.341	.806	16.460	.000
Race	R	-.137	.872	.351	.152	.697
Traditional age	TS	-18.451	.000	19857.539	.000	.999
Decision type	D	18.597	1.19E+08	19857.539	.000	.999
Adult Learner	AL	-18.734	.000	19857.539	.000	.999
No control of choice	NC	-1.100	.333	.326	11.400	.001

Assessing the contribution of each of the situation movement variables, only one was significant- no control of choice (p=.001). Those indicating a lack of control over their decision outcome were 67% (odds ratio= .333) less likely to apply. It is interesting to note that the introduction of the variable changed the significance level of the first generation status variable (p= .108).

Based on these findings, reporting a difficulty that decreased the respondent's control had a significant effect on whether the respondent applied [p= .001]. Therefore, the null hypothesis (H_0) is REJECTED in favor of the alternate hypothesis (H_1).

Perception of Information

The next iteration of the model included the variable, perception of information. The variable was measured by a closed-ended survey question asking respondents to rate the information they used in the decision-making process as hindering, having no effect or being supportive. The variable was included in the model to test the assumption that information is generally supportive to the user and facilitates the decision-making process. This research contends that information may have a negative

or no effect on the process. To measure this concept, a dummy variable was created grouping the hindering and no effect responses, to represent information not supporting the process. The zero value represented seeing information as supportive. The odds ratio calculated provides the difference in likelihood based on seeing information as not supporting the process. The following hypothesis can be asserted:

Hypothesis 2:

H_0: Respondents that indicate information was not supportive to their process will not be less likely to apply.

H_1: Respondents that indicate information was not supportive to their process will be less likely to apply.

The addition of the variable perception of information resulted in the following logistic regression equation:

$$App = \beta_0 + \beta_1 FG + \beta_2 I + \beta_3 R + \beta_4 FI + \beta_5 TS + \beta_6 D + \beta_7 AL + \beta_8 CO + \beta_9 NC + \beta_{10} PI$$

Where, variables FG through AL represent the demographic-based model and CO represents having control of the decision outcome, NC, no control, and PI, perception of information.

Table 33: Block 3 Classification Table

Observed			Predicted		
			Did you apply to schools?		Percentage Correct
			No	Yes	
Step 1	Did you apply to schools?	No	8	51	13.2
		Yes	5	349	98.6
	Overall Percentage				86.4

The introduction of the perception of information variable decreased the overall predictive power of the model from 86.6% to 86.4% and the percentage predicted of those who did not apply decreased from 14.3% to 13.2%.

Table 34: Block 3 Goodness of Fit

-2 Log Likelihood	Chi-Square	df	Sig.
285.373	52.901	9	.000

The introduction of the variable also significantly reduced the overall model -2 LL at the 95 percent confidence level (p= .000).

Table 35: Block 3 Variables in the Equation

Variable		β	Expβ	S.E.	Wald	Sig.
Constant	β_0	.343	1.409	.821	.174	.676
First generation	FG	-.651	.521	.315	4.281	.039
Income level	I	1.372	3.944	.595	5.327	.021
Familiarity index	FI	3.051	21.145	.796	14.704	.000
Race	R	-.203	.816	.357	.324	.569
Traditional age	TS	-18.858	.000	19677.262	.000	.999
Decision type	D	18.929	1.66E+08	19677.262	.000	.999
Adult Learner	AL	-19.060	.000	19677.262	.000	.999
No control of choice	NC	-.754	.470	.355	4.526	.033
Perception of Information	PIh	-.915	.400	.336	7.396	.007

The variable perception of information was also significant in the equation (p= .007). Respondents indicating the information they used was hindering or had no effect were almost 60% less likely to apply (1-.400).

Based on these findings, those who saw information as not supportive to the decision-making process were less likely to apply. Therefore, the null hypothesis (H_0) is REJECTED in favor of the alternate hypothesis (H_1).

Helps Used Variables

At the next iteration, the types of helps used were added to the model. These variables represent what respondents used or needed in the decision-making process. The word help was used to encourage respondents to go beyond just information. The types were created by aggregating the initial more specific categories in order to facilitate interpretation. These broad types were consistent for all three of the variables describing the decision process: helps used, barriers and helps wanted. The addition of types of helps used resulted in the following equation:

$$App = \beta_0 + \beta_1 FG + \beta_2 I + \beta_3 R + \beta_4 FI + \beta_5 TS + \beta_6 D + \beta_7 AL + \beta_8 CO + \beta_9 NC + \beta_{10} PI + \beta_{11} HUm + \beta_{12} HUsc1 + \beta_{13} HUis1 + \beta_{14} HUss1 + \beta_{15} HUpl1 + \beta_{16} HUoth$$

Where, variables FG through AL represent the demographic-based model and CO represents having control of the decision outcome, NC, no control, and PI, perception of information. The remaining variables, HUm through HUoth, represent the types of helps used in the process, money, school characteristics, informational support, social support, personal life characteristics and other.

Table 36: Block 4 Classification Table

			Predicted		
			Did you apply to schools?		Percentage Correct
	Observed		No	Yes	
Step 1	Did you apply to schools?	No	10	49	17.0
		Yes	8	346	97.8
	Overall Percentage				86.2

At this stage the overall predictive power of the model decreased, from 86.4% to 86.2%. The prediction percentage of those who did not apply increased from 14.3% to 17.0%.

Table 37: Block 4 Goodness of Fit

-2 Log Likelihood	Chi-Square	df	Sig.
278.189	60.086	10	.000

The overall model log likelihood was also significantly reduced at the 95 percent confidence level (p= .000).

Table 38: Block 4 Variables in the Equation

Variable		β	Expβ	S.E.	Wald	Sig.
Constant	β_0	.331	1.392	.819	.163	.686
First generation	FG	-.670	.511	.320	4.392	.036
Income level	I	1.523	4.587	.606	6.318	.012
Familiarity index	FI	3.173	23.889	.812	15.263	.000
Race	R	-.151	.860	.364	.173	.678
Traditional age	TS	-18.613	.000	19666.416	.000	.999
Decision type	D	18.716	1.34E+08	19666.416	.000	.999
Adult Learner	AL	-18.935	.000	19666.416	.000	.999
No control of choice	NC	-.689	.520	.357	3.730	.053
Perception of Information	PIh	-.975	.377	.341	8.179	.004
Helps Used- Social support	HUss1	-1.149	.317	.412	7.780	.005

Only one of the types of helps used was significant, social supports. Respondents indicating they used social support in their decision-making process were 68% (odds ratio= .317) less likely to apply. The prevailing conclusion is that students who do not apply have less social support than those that do. The direction of the relationship conflicts with the existing literature and the stated hypothesis.

Table 39: Variables not in the Equation

			Score	df	Sig.
Step 1	Variables	HU_m	1.325	1	.250
		HUsc1	3.596	1	.058
		HUis1	.619	1	.432
		HUpl1	.013	1	.910
		HU_oth	.256	1	.613
	Overall Statistics		5.685	5	.338

All of the other types of helps used, money, school characteristics, information support, and personal life characteristics, were not significant to the decision of whether or not to apply. It is interesting to note that informational support was not significant to the decision to apply. A consistent finding in the access literature has been that those most likely not to apply have had less information about higher education. Also, the main strategy of access programs is to provide a greater level of information to parents and prospective students. Therefore, one would assume that the respondents that did apply would be more likely to indicate using information in the decision-making process. However, there was no significant difference in using information in the process for those who did and those who did not apply.

For the six variables introduced, only one was significant in the model. However, the direction was the inverse of that stated in the hypothesis. Therefore, based on these findings, none of the hypotheses for types of helps used can be supported (See Table 44).

Barriers Variables

At the next iteration the types of barriers were added to the model. These variables represented the barriers that respondents indicated facing in the decision-making process. The types were created by aggregating the initial more specific categories in order to facilitate interpretation.

The addition of the barriers variables resulted in the following:

$$App = \beta_0 + \beta_1 FG + \beta_2 I + \beta_3 R + \beta_4 FI + \beta_5 TS + \beta_6 D + \beta_7 AL + \beta_8 CO + \beta_9 NC + \beta_{10} PI + \beta_{11} HUm + \beta_{12} HUsc1 + \beta_{13} HUis1 + \beta_{14} HUss1 + \beta_{15} HUpl1 + \beta_{16} HUoth + \beta_{17} Bm + \beta_{18} Bsc1 + \beta_{19} Bis1 + \beta_{20} Bss1 + \beta_{21} Bpl1 + \beta_{22} Both$$

Where, variables FG through AL represent the demographic-based model and CO represents having control of the decision outcome, NC, no control, and PI, perception of information. The remaining variables, HUm through HUoth, represent the types of helps used in the process. Bm through Both represent the types of barriers in the process, money, school characteristics, informational support, social support, personal life characteristics and other.

Table 40: Block 5 Classification Table

			Predicted		
			Did you apply to schools?		Percentage Correct
	Observed		No	Yes	
Step 1	Did you apply to schools?	No	14	45	23.4
		Yes	9	345	97.4
	Overall Percentage				86.9
Step 2	Did you apply to schools?	No	13	46	22.4
		Yes	3	351	99.1
	Overall Percentage				88.2

The addition of the variables increased the overall prediction percentage of the model from 86.2% to 88.2%. The percentage predicted of those who did not apply increased from 17.0% to 22.4%.

Table 41: Block 5 Goodness of Fit

-2 Log Likelihood	Chi-Square	df	Sig.
269.123	69.152	12	.000

The overall model log likelihood was also significantly reduced by the introduction of the variables at the 95 percent confidence level (p= .000).

Table 42: Block 5 Variables in the Equation

Variable		β	Expβ	S.E.	Wald	Sig.
Constant	β_0	-.190	.827	.868	.048	.827
First generation	FG	-.823	.439	.333	6.110	.013
Income level	I	1.865	6.453	.633	8.672	.003
Familiarity index	FI	3.357	28.713	.845	15.775	.000
Race	R	.044	1.045	.382	.014	.907
Traditional age	TS	-18.194	.000	19993.450	.000	.999
Decision type	D	18.334	91702852	19993.450	.000	.999
Adult Learner	AL	-18.713	.000	19993.450	.000	.999
No control of choice	NC	-.774	.461	.377	4.223	.040
Perception of Information	PIh	-.933	.393	.347	7.219	.007
Helps Used- Social support	HUss1	-1.421	.241	.423	11.266	.001
Barriers- Money	Bm	.835	2.305	.407	4.217	.040
Barriers- Social support	Bss1	-1.672	.188	.734	5.191	.023

Assessing the individual types, only two were significant, money and social support. Respondents indicating social support as a barrier were 81% (odds ratio= 1-.188) less likely to apply. Money was also a significant type of barrier. Respondents indicating money as a barrier were twice as likely to apply (odds ratio= 2.305). The direction of this relationship is the inverse of the prevailing conclusions of existing

literature and the stated hypothesis for the study. The accepted assumption is that money exists as a barrier that causes individuals not to apply because they cannot afford participation.

Table 43: Variables not in the Equation

			Score	df	Sig.
Step 1	Variables	B_m	4.310	1	.038
		B_oth	.043	1	.836
		Bsc1	1.378	1	.240
		Bis1	.184	1	.668
		Bpl1	.073	1	.788
	Overall Statistics		6.458	5	.264
Step 2	Variables	B_oth	.066	1	.797
		Bsc1	1.738	1	.187
		Bis1	.252	1	.615
		Bpl1	.128	1	.721
	Overall Statistics		2.206	4	.698

The other types of barriers were not found to be significant in the decision to apply. This is an interesting finding because research has assumed that adult learners have different barriers and use different considerations when deciding to participate (Golonka, S. & Matus-Grossman, 2001; Levin, J.S., 2007; Pusser et al, 2007; Timarong, A., Temaungil, M., & Sukrad, W., 2002). For instance, personal life characteristics, such as family or work obligations, should have a greater effect on the decision making of adult learner respondents. And with 47% of the study sample falling in the category of non-traditional student, it was assumed that having personal life characteristics as a barrier would be significant to the decision outcome.

Based on these findings, only hypothesis 11 can be supported. The variable in hypothesis 8, money, did have a significant effect; however, the direction of the relationship would have to be changed (See Table 44).

Helps Wanted Variables

At the next iteration the types of the helps wanted were included in the model. These variables represent the things respondents indicated they wanted to have in the decision process. Again, the initial categories coded were aggregated into five types that were consistent for the three conceptual variables describing the decision process, helps used, barriers and helps wanted. The addition of the variables resulted in the following final equation:

$$App = \beta_0 + \beta_1 FG + \beta_2 I + \beta_3 R + \beta_4 FI + \beta_5 TS + \beta_6 D + \beta_7 AL + \beta_8 CO + \beta_9 NC + \beta_{10} PI + \beta_{11} HUm + \beta_{12} HUsc1 + \beta_{13} HUis1 + \beta_{14} HUss1 + \beta_{15} HUpl1 + \beta_{16} HUoth + \beta_{17} Bm + \beta_{18} Bsc1 + \beta_{19} Bis1 + \beta_{20} Bss1 + \beta_{21} Bpl1 + \beta_{22} Both + \beta_{23} HWm + \beta_{24} HWsc1 + \beta_{25} HWis1 + \beta_{26} HWss1 + \beta_{27} HWpl1 + \beta_{28} HWoth$$

Where, variables FG through AL represent the demographic-based model and CO represents having control of the decision outcome, NC, no control, and PI, perception of information. The remaining variables, HUm through HUoth, represent the types of helps used in the process. Bm through Both represent the types of barriers. And HWm through HWoth represent the types of helps wanted in the process, money, school characteristics, informational support, social support, personal life characteristics and other.

Using a conditional cutoff value of .05 for the step-wise calculation, the final block, the helps wanted variables, was not included because none of the variables were significant. Therefore, using a p-value of .05 for entry into the equation, none of the hypotheses relating to helps wanted (numbers 13 through 17) could be supported (See Table 44).

Table 44: Final Hypotheses Summary for 95% Confidence Level

Sense-Making Variable	Hypotheses Supported
Situation Movement	1. Respondents that indicate a difficulty that decrease their control over the choice will be less likely to apply.
Perception of Information	2. Respondents that indicate information was not supportive to their process will be less likely to apply.
Barriers	11. Respondents that indicate social supports as a barrier to the decision-making process will be less likely to apply.
	Hypotheses Not Supported
Helps Used	3. Respondents that indicate using financial assistance in the decision-making process will be less likely to apply. 4. Respondents that indicate using school characteristics in the decision-making process will be more likely to apply. 5. Respondents that indicate using informational supports in the decision-making process will be more likely to apply. 6. Respondents that indicate using social supports in the decision-making process will be more likely to apply. 7. Respondents that indicate using personal life characteristics in the decision-making process will be less likely to apply.
Barriers	8. Respondents that indicate money as a barrier to the decision-making process will be less likely to apply. 9. Respondents that indicate school characteristics as a barrier to the decision-making process will be less likely to apply. 10. Respondents that indicate informational supports as a barrier to the decision-making process will be less likely to apply. 12. Respondents that indicate personal life characteristics as a barrier to the decision-making process will be less likely to apply.
Helps Wanted	13. Respondents that indicate wanting financial resources for the decision-making process will be less likely to apply. 14. Respondents that indicate wanting different school characteristics will be less likely to apply. 15. Respondents that indicate wanting informational supports will be less likely to apply. 16. Respondents that indicate wanting social supports will be less likely to apply. 17. Respondents that indicate wanting changes to personal life characteristics will be less likely to apply.

Redefined Stepwise Analysis

To determine if any of the variables may be approaching significance the entire analysis was run with a conditional cutoff value of .10 for the step-wise calculation. Again, the variables were grouped in blocks according to the conceptual variables in the Sense-Making model. The following tables represent the statistics for the full model, including all of the Sense-Making variables.

Table 45: Final Block Classification Table

Observed			Predicted		
			Did you apply to schools?		Percentage Correct
			No	Yes	
Step 1	Did you apply to schools?	No	10	49	17.5
		Yes	9	345	97.5
	Overall Percentage				86.1
Step 2	Did you apply to schools?	No	16	43	27.3
		Yes	4	350	98.9
	Overall Percentage				88.7
Step 3	Did you apply to schools?	No	16	42	28.0
		Yes	3	351	99.1
	Overall Percentage				89.0

Under the new conditions, the prediction percentage for the overall model increased slightly from 88.2% to 89.0% and the percentage for those who did not apply increased from 22.4% to 28.0%.

Table 46: Final Block Goodness of Fit

-2 Log Likelihood	Chi-Square	df	Sig.
263.917	74.358	14	.000

The overall model was also significant with a model chi-square of 74.358 (p= .000).

Table 47: Final Block Variables in the Equation

Variable		β	Expβ	S.E.	Wald	Sig.
Constant	β_0	-.302	.739	.884	.117	.739
First generation	FG	-.829	.436	.336	6.078	.014
Income level	I	1.878	6.539	.633	8.793	.003
Familiarity index	FI	3.260	26.051	.858	14.423	.000
Race	R	-.003	.997	.386	.000	.993
Traditional student	TS	-18.049	.000	20117.141	.000	.999
Decision type	D	18.287	87514892	20117.141	.000	.999
Adult learners	AL	-18.631	.000	20117.141	.000	.999
No control of choice	NC	-.694	.500	.380	3.336	.068
Perception of Info	PI	-.952	.386	.353	7.254	.007
Helps used- school characteristics	HUsc1	.637	1.891	.343	3.449	.063
Helps used- social support	HUss1	-1.358	.257	.430	9.985	.002
Barriers- money	Bm	.839	2.315	.411	4.164	.041
Barriers- school characteristics	Bsc1	-.646	.524	.394	2.696	.101
Barriers- social support	Bss1	-1.653	.192	.753	4.812	.028

Two new variables, both school characteristics, were included in the new model equation. Both were significant using a 90 percent confidence level. In the group of helps used variables, school characteristics became significant (.101), with those respondents indicating using school characteristics in the decision process being 89% more likely to apply (odds ratio= 1.891). They were also significant as a barrier to the process (p= .063). Respondents noting them as a barrier were 48% less likely to apply (odds ratio= 1-.524).

These findings tell us that when school characteristics are used in the decision-making process the respondent was more likely to apply. For those who noted them as

a barrier, they were less likely to apply. The direction of the relationships supports the stated hypotheses for these two variables. Based on these findings, if the confidence level is changed to 90 percent for variable entry into the model equation, two additional hypotheses (number 4 and 9) relating to school characteristics variables can be supported (See Table 48).

Table 48: Final Hypotheses Summary for 90% Confidence Level

Sense-Making Variable	Hypotheses Supported
Situation Movement	1. Respondents that indicate a difficulty that decreases their control over the choice will be less likely to apply.
Perception of Information	2. Respondents that indicate information was hindering to their process will be less likely to apply.
Helps Used	4. Respondents that indicate using school characteristics in the decision-making process will be more likely to apply.
Barriers	9. Respondents that indicate school characteristics as a barrier to the decision-making process will be less likely to apply. 11. Respondents that indicate social supports as a barrier to the decision-making process will be less likely to apply.
	Hypotheses Not Supported
Helps Used	3. Respondents that indicate using financial assistance in the decision-making process will be less likely to apply. 5. Respondents that indicate using informational supports in the decision-making process will be more likely to apply. 6. Respondents that indicate using social supports in the decision-making process will be more likely to apply. 7. Respondents that indicate using personal life characteristics in the decision-making process will be less likely to apply.
Barriers	8. Respondents that indicate money as a barrier to the decision-making process will be less likely to apply. 10. Respondents that indicate informational supports as a barrier to the decision-making process will be less likely to apply. 12. Respondents that indicate personal life characteristics as a barrier to the decision-making process will be less likely to apply.
Helps Wanted	13. Respondents that indicate wanting financial resources for the decision-making process will be less likely to apply. 14. Respondents that indicate wanting different school characteristics will be less likely to apply. 14. Respondents that indicate wanting informational supports will be less likely to apply. 15. Respondents that indicate wanting social supports will be less likely to apply. 16. Respondents that indicate wanting changes to personal life characteristics will be less likely to apply.

Final Model Discussion (90 percent confidence level)

The stepwise logistic regression analysis results defined the variables that are significant in determining group membership, whether the respondent applied or did not apply to postsecondary education. Based on the results of the analysis a final significant model can be defined:

App= $\beta_0 + \beta_1 FG + \beta_2 I + \beta_3 FI + \beta_4 NC + \beta_5 PI + \beta_6 HUsc1 + \beta_7 HUss1 + \beta_8 Bm + \beta_9 Bsc1 + \beta_{10} Bss1$

Table 49: Final Model Variables in the Equation

Variable		β	Expβ	S.E.	Wald	Sig.
Constant	β_0	-.302	.739	.884	.117	.739
First generation	FG	-.829	.436	.336	6.078	.014
Income level	I	1.878	6.539	.633	8.793	.003
Familiarity index	FI	3.260	26.051	.858	14.423	.000
No control of choice	NC	-.694	.500	.380	3.336	.068
Perception of Info	PI	-.952	.386	.353	7.254	.007
Helps used- school characteristics	HUsc1	.637	1.891	.343	3.449	.063
Helps used- social support	HUss1	-1.358	.257	.430	9.985	.002
Barriers- money	Bm	.839	2.315	.411	4.164	.041
Barriers- school characteristics	Bsc1	-.646	.524	.394	2.696	.101
Barriers- social support	Bss1	-1.653	.192	.753	4.812	.028

The familiarity index variable (FI) was the most influential of all of the variables by a large margin. With each increase in level of familiarity, respondents were 25 times more likely to apply (odds ratio= 26.051). The second largest effect is provided by income level (I). For each increase in income category, respondents were approximately five times more likely to apply (odds ratio= 6.539). Both of these variables were included in the D-B model. This finding reflects the current research on the access topic

which generally focuses on these variables to study the topic and to define programmatic strategies. Another variable that is generally included in current research is first generation status (FG). The variable does have a significant effect on applying. The results of this study indicate that first generation students are 56% less likely to apply (odds ratio= 1-.436). This is consistent with current research which has placed first generation students at a disadvantage in terms of preparation, as well as possessing the information and social capital that facilitates participation in postsecondary education (Berkner & Chavez, 1997; Horn & Nunez, 2000; Hossler, Schmit, & Vesper, 1999; Kojaku & Nunez, 1998; Pratt & Skaggs, 1989; Stage & Hossler, 1989; Warburton, Bugarin, & Nunez, 2001; York-Anderson & Bowman, 1991).

The most influential variable from the Sense-Making model was money. However, its' effect on the decision to apply was not in the expected direction. Respondents indicating money as a barrier were two times more likely to apply (odds ratio= 2.315). This finding conflicts with the assumed relationship between money and applying to college. Previous literature has indicated money being a barrier that causes individuals not to apply (Akerhielm, A., et al., 1998; Cabrera, A. F., & La Nasa, S. M. ,2000a; Ficklen, E. & Stone, J. E., 2002; Hossler, D., Schmit, & Vesper, 1999; Kane, T., 1995; National Center for Education Statistics, 2003). One possible explanation could be that those who do not apply make the decision before paying for college is even a consideration. This conclusion would indicate that money is not causing the decision not to apply, but other factors in the decision process are more influential. Further research is necessary to investigate the relationship and better define this conclusion.

How respondents viewed their control over the decision-making process also had a significant effect on applying. Individuals indicating a decision process where they had no control over choosing the outcome were 50% less likely to apply (odds ratio= 1-.500). Twenty percent of the study sample indicated having a difficulty where they had no control over choosing the outcome. The largest portion of that group, representing 9% of the sample, indicated seeing an option but something or someone was standing in the way, followed closely by those who indicated seeing an option but as you moved through the decision-making process that option disappeared at 7%. There was no statistically significant difference for those who saw their difficulty as choosing between a number of options.

Table 50: Situation Movement Frequencies

	%[15]	N
Had difficulty moving forward (Yes in Q5)	30	132
Seeing a number of options available	7	29
Seeing an option but something or someone standing in the way	9	38
Seeing no options available	1	6
Seeing an option but as you moved through the decision-making process that option disappeared	7	28
Seeing your options as being forced upon you	3	14
DK/NA type of difficulty (DK in Q6)	4	17
No difficulties (No in Q5)	68	311
DK if difficulty (DK in Q5)	2	5
Total	100	448

This finding indicates that individuals may want to participate in postsecondary education, but something beyond their control is stopping them. They have moved

[15] Percentages may add to 99 or 101 due to rounding.

through the process far enough to have defined an option, but they are not able to proceed with the choice. The most obvious reason for not being able to proceed would be money or not being able to afford participation. However, the analysis has shown that noting money as a barrier actually increased the likelihood of deciding to apply. Again, further research could provide a better definition of the difficulty.

Perception of information also had a significant effect on applying. Respondents were asked to rate the information they used in the process; whether it was supportive, had no effect, or was hindering. Respondents who indicated information was hindering or had no effect were 61% less likely to apply (1-.386). This finding shows that information in and of itself is not always helpful to the decision-making process. Addressing the access problem, program strategies have focused on providing a higher level of information to parents and students. However, programs are not focused on the perception of that information and usefulness of the information is not taken into account. It is important to determine if the information being provided is actually facilitating the decision-making process. In this study, 16% of respondents felt the information they used had no effect in the process and 12% felt the information was hindering to the process. In other words, 28%, or more than one in four of the respondents did not see information as helping their decision-making process. Because the perception of information had a significant effect on applying it is important to understand what makes information supportive when developing a strategy to answer the access problem. The goal should be to make information more accessible to students, not from the perspective of receiving the information, but having parents and

potential students actually be able to understand and use the information in the decision process.

Table 51: Perception of Information Frequencies

	%
Supportive	68
Neutral	16
Hindering	12
DK/NA	3

As previously discussed those who indicated using social support in the decision process were also less likely to apply. Because open-ended questions were used to measure the initial conceptual variables, social support can be broken down into the initial categories created to code the verbatim responses. These categories, perception of family and friends, parents' opinion, and advising, are more specific and provide greater definition to the concept of social support. The most often cited of three is perception of family and friends, with 8% of the sample naming it as a help used. Next, is parents' opinion with 3% and advising with 1%. In the literature, it is assumed that those who do not apply lack the social support necessary to make the decision. However, these findings indicate social support for those who do not apply is not assisting the decision-making process, but instead making it more difficult. So perhaps this indicates a lack of quality in the social support provided.

We assume that getting parents and family involved will have a positive effect on getting individuals into higher education, but that may not be the case. Cabrera & DeNasa (2001) found that the most noteworthy factor in the choice to apply is the level of parental encouragement. The idea of encouragement is different than involvement.

Encouragement implies possessing a positive viewpoint regarding the choice in question. Having the parent be involved in the decision does not require a particular viewpoint, so that involvement could be negative as well, having a negative effect on the decision outcome. Many studies have focused on defining positive roles that parents can play, such as setting expectations for attendance, initiating the discussion of the planning process and saving money to finance the education (Cabrera & La Nasa, 2000a; Cabrera & La Nasa 2000b; Choy, Horn, Nunez, & Chen, 2000; Cabrera & La Nasa, 2001; Conklin & Dailey, 1981; Flint, 1992; Keller & McKewon, 1984; Hossler, 1999; Stage & Hossler, 1989). However, the negative influences of support may not be just the inverse of the positive roles that have been defined. Future research could define the negative effects in order to more effectively address the problem.

Table 52: Helps Used Social Support Categories

	%
Perception of family and friends	8
Parents' opinion	3
Advising	1

Noting social support as a barrier to the process also made respondents 81% less likely to apply (1-.192). Social support as barrier was comprised of the categories, student disagrees with parent, friends and motivation. For each of the categories approximately 1% of the sample indicated the response.

Table 52: Barriers Social Support Categories

	%
Motivation	1
Student disagrees with parent	1
Friends	1

School characteristics were significant as a help used and as a barrier. However, the direction of the relationship is different for each. When school characteristics are indicated as being used in the decision process, the respondent is 89% more likely to apply (odds ratio= 1.891). Conversely, when school characteristics are noted as a barrier to the process, the respondent is 48% less likely to apply (odds ratio= 1-.524). In order to appropriately interpret these results, disaggregating each of the variables is necessary.

School characteristics that were used in the decision process were location, availability of part-time status, admission requirements needed, programs offered and curriculum requirements, flexibility in scheduling, campus safety and transferability of credits. The two characteristics most often noted were location and the programs offered and curriculum requirements, indicated by 33% and 18% of respondents respectively. These findings concur with the existing literature. Location has proved to be a significant factor in the college choice decision in a number of studies (Long, 2004; Hoxby, 1999; Manski & Wise, 1983). As discussed in the first section of the chapter using school characteristics in the decision process is indicative of using or attempting to use a rational approach to decision making. Because the use of school characteristics is increasing the likelihood of deciding to apply, one could assume that the rational

process is creating a positive outcome, the one desired by access programs. Or it could be that the individuals that use a rational process to make the decision are more likely to apply for some other reason.

The fact that school characteristics are also significant as a barrier in the process would lend credibility to the latter assumption. Three of the categories that make up school characteristics, location, needing a part-time program and not offering a course or program, indicate a problem with fitting the school option with the individual. These barriers relate to the finding for situation movement. Respondents who saw themselves as having no control over the decision outcome were less likely to apply. These school characteristics, which are making respondents less likely to apply, are also out of their control. If an individual is place bound and schools in the area do not offer the course of study they desire, they are unable to choose to participate.

The other two categories, not having the grades or test scores and not being accepted by the school, also relate to the problem of control of decision outcome. If you are not accepted by an institution, the choice to attend is out of your control. These categories indicate that individuals not having the credentials for postsecondary education may want to participate, but cannot. This problem was discussed in Chapter 2. Students think they will go to college, but they do not take the steps necessary to prepare themselves to be a part of the process. Previous literature has discussed this issue and a number of access programs focus on making parents and students aware of the requirements necessary while they still have time to acquire them, in middle school and freshman year of high school (KnowHow2Go.org, n.d.; Orr et al, 2007).

Table 54: School Characteristics Barrier Categories

	%
Location	5
Needed a part-time program	5
Didn't have grades or test scores	4
Didn't offer course or program	3
Acceptance by school	2

Differences by Type of Student

This study has included prospective traditional aged students, as well as adult learners, in the study sample. Generally, research focuses on one type of student and as discussed in Chapter Two research on adult learners have indicated there are some different considerations based on the age or type of student (Golonka, S. & Matus-Grossman, 2001; Levin, J.S., 2007; Pusser et al, 2007; Timarong, A., Temaungil, M., & Sukrad, W., 2002). In order to determine whether there were differences in the decision-making process for traditional aged students versus adult learners, a two group analysis using logistic regression was performed. The final significant model variables were used (see p. 105).

Traditional Aged Student

The first group identified was traditional aged students. These respondents were aged 18 to 29 and they were making the decision for themselves, not someone in their household. After selecting out the traditional aged students, 79 cases were included in the analysis.[16] The overall model was significantly different from the baseline (p= .000).

[16] The small number of cases increases the chance of Type II error.

Table 56: Traditional Aged Group Goodness of Fit

-2 Log Likelihood	Chi-Square	df	Sig.
42.990	56.228	10	.000

While the overall model was significant, not all of the final model variables were.

Table 57: Traditional Aged Group Significant Variables

Variable		β	Expβ	S.E.	Wald	Sig.
Constant	β_0	4.707	110.758	2.743	2.946	.086
First generation	FG	-5.688	.003	2.054	7.670	.006
Familiarity index	FI	5.857	349.752	2.738	4.576	.032
Income	I	1.729	5.635	1.898	.830	.362
No control of choice	NC	-2.316	.099	1.503	2.375	.123
Perception of Information	PIh	-2.042	.130	1.647	1.537	.215
Helps used- school characteristics	HUsc	-.594	.552	1.256	.223	.637
Helps used- social support	HUss1	-4.456	.012	1.269	12.323	.000
Barriers- money	Bm	1.949	7.021	1.112	3.073	.080
Barriers- school characteristics	Bsc	-1.214	.297	1.450	.700	.403
Barriers- social support	Bss1	-5.857	.003	2.006	8.522	.004

As with the full study sample analysis the familiarity index variable was the most influential and greatly increased the likelihood of a respondent applying. For each increase in familiarity level, a respondent was almost 350 times more likely to apply (odds ratio = 349.752). When the decision was being made for a first generation student who was traditional age (18-29 years old), they were 99.7% less likely to apply (odds ratio = 1-.003).

Two of the Sense-Making variables had a significant effect on applying for traditional aged students. Social support was a significant variable for traditional aged students. When students noted using social support in the decision process, they were

99% less likely to apply (odds ratio = .012). Social support was also significant, with respondents noting it as a barrier being 99.7% less likely to apply (odds ratio = 1-.003). Each of these findings is consistent with the overall study sample model.

Adult Learners

Another group analysis was performed selecting only adult learners, or respondents indicating they were aged 30 years or older and were making the decision for themselves. After selecting the cases, 212 were included in the analysis. The overall model was significantly different from the baseline (p= .000).

Table 58: Adult Learners Group Goodness of Fit

-2 Log Likelihood	Chi-Square	df	Sig.
122.860	45.812	10	.000

Table 59: Adult Learner Group Significant Variables

Variable		β	Expβ	S.E.	Wald	Sig.
Constant	β_0	-2.114	.121	1.087	3.784	.052
First generation	FG	-.318	8.72	.493	.415	.519
Income level	I	2.884	17.891	.941	9.401	.002
Familiarity index	FI	4.162	64.187	1.310	10.097	.001
No control of choice	NC	-1.303	.272	.538	5.868	.015
Perception of Info	PI	-1.017	.362	.506	4.044	.044
Helps used- school characteristics	HUsc1	.563	1.756	.490	1.319	.251
Helps used- social support	HUss1	-1.101	.333	.722	2.321	.128
Barriers- money	Bm	1.571	4.813	.671	5.489	.019
Barriers- school characteristics	Bsc1	-.237	.789	.588	.163	.687
Barriers- social support	Bss1	-22.653	.000	44378.962	.000	1.00

While the overall model was significant, not all of the final model variables were. For instance, first generation status did not have a significant effect on applying for

adult learners. In order to determine the difference in rate of applying between the two groups, a three-way cross tabulation was performed. The result indicates that adult learners who are first generation students do not apply at a significantly different rate than those who are not first generation, 82% versus 86% respectively. As noted previously, traditional aged students who are also first generation students do have a lower rate of applying. Specifically, 73% of those who were first generation students applied, while 95% of those who were not first generation applied. This distinction makes sense based on the findings of previous literature. Research indicates first generation status being significant because it indicates a lower level of social support and familiarity with postsecondary education overall because the parent(s) have a lack of experience as well. It would follow that by the time one is 30 or older the level of parental influence in decision making has decreased to the point of having little to no effect.

Table 60: Three-way Cross Tabulation- First Generation Status and Adult Learners

Adult learner – own decision		
	Apply %	Not Apply %
First generation	82	18
Not first generation	86	15

Table 61: Three-way Cross Tabulation- First Generation Status and Traditional Aged

Traditional aged – own decision		
	Apply %	Not Apply %
First generation	73	27
Not first generation	95	5

As with the other models, the familiarity index had the greatest influence. For each increase in level of familiarity an adult learner was 64 times more likely to apply (odds ratio = 64.187). Income level was significant for adult learners, but not for the traditional aged students. With each increase in income level, an adult learner was 17 times more likely to apply (odds ratio = 17.891). Both of these results are consistent with the findings in the literature.

For adult learners three of the Sense-Making variables were significant. Noting money as a barrier had the greatest level of influence on applying. Adult learner respondents who noted money as a barrier to their decision process were almost four times more likely to apply (odds ratio = 4.813). This finding is consistent with the result for money as a barrier in the full model. However, the direction of this relationship is contrary to the prevailing literature which indicates money being a barrier that makes individuals less likely to apply. In order to determine whether the relationship may be different based on the type of student, traditional age or adult learner, a three-way cross tabulation was performed.

The results indicated that adult learners that noted money as a barrier were more likely to apply, with 88%, than those who did not note money as a barrier, with 82%. Examining only traditional aged students, the relationship is different. There was no difference in the rate of applying for traditional aged students who noted money as a barrier versus those who did not, both with 88% applying. A possible explanation for the difference between the two groups is the different role that money plays based on the age and stage of life of the individual. This conclusion could indicate that money is

not causing the decision not to apply, but other factors in the decision process are more influential. However, further research would be necessary to define the relationship.

Table 62: Three-way Cross Tabulation- Money and Adult Learners

Adult learners – own decision		
	Apply %	Not Apply %
Money as barrier	88	12
None	82	18

Table 63: Three-way Cross Tabulation- Money and Traditional Aged

Traditional aged – own decision		
	Apply %	Not Apply %
Money as barrier	86	14
None	86	14

The situation movement variable was also significant. Respondents indicating a difficulty that decreased their control over choosing their preferred outcome were 73% less likely to apply (odds ratio = 1-.272). Finally, perception of information had a significant effect on whether a respondent applied. Respondents indicating information was not supportive to their decision process were 64% less likely to apply (odds ratio = 1-.362).

The group analyses indicated that different variables have an effect on applying for traditional aged students and adult learners. While familiarity level was significant for both groups, it appears that the distinction is how the individual becomes familiar. For traditional aged students, social support, which should contribute to the individual's overall familiarity with postsecondary education, had a significant negative impact on

the decision process. First generation status, using social support in the decision process and noting social support as a barrier in the process all made a traditional aged respondent less likely to apply. However, none of these variables were significant to the decision to apply for adult learners. For adult learners the problem seems to lie with utilizing information, which should serve to increase the individual's familiarity. Adult learners who felt information was not supportive to their decision process were 64% less likely to apply.

This chapter has explained the main findings of the survey, discussed the results of the logistic regression analysis, and provided a two group analysis to determine the differences in the decision process of traditional aged and adult learners. The analysis has provided an analysis of the information sources regarding postsecondary education. Information did not serve its intended purpose, to support and facilitate the decision-making process, for more than one in four respondents. Similarly, almost one in three wished they had had informational support for their decision process. Findings also indicated an issue with individuals matching school characteristics with their own needs and desires.

The logistic regression analysis was conducted to determine the influence the model variables had on the decision to apply to postsecondary education. The results provided further support for these conclusions, with respondents being less likely to apply if information was not supportive to the decision process. Lack of control of the

decision outcome, using social support to make the decision, and noting school characteristics or social support as a barrier also made respondents less likely to apply.

The group analysis indicated that while familiarity level was significant to each group being more likely to apply, each group had significant factors that may be affecting the level of familiarity. For traditional students, social support factors were causing a decrease in the odds of applying. But for adult learners the problem was utilizing information effectively in the process.

The next chapter will review the study and discuss conclusions drawn from the findings and also provide recommendations for policy and possible future study.

CHAPTER FIVE
CONCLUSIONS AND RECOMMENDATIONS

Study Overview

The issue of access, ensuring all individuals have the opportunity to attain a higher education, is an interest for possible students, colleges and universities, government agencies and institutions, and society as discussed in chapter one. As such, numerous research studies have been conducted to assess the magnitude of inequality in access and to determine the underlying factors causing the problem. Consistently it has been shown that income and one's level of information and familiarity with higher education are indirectly related to participating in higher education, with lower income individuals who generally possess less information about and familiarity with higher education being less likely to participate. In addition research has indicated that other demographic characteristics, race and first generation status are correlated with non-participation, with minorities and first generation students being less likely to participate (Adelman, 2002; Education Trust, 2001; Ficklen & Stone, 2002; Sanoff, 2003; Venezia, Kirst & Antonio, 2003; Akerhielm, et al, 1998; Cabrera & De Nasa, 2000; Flippen & Graham, 2005; Hossler, Schmit, & Vesper, 1999; Ikenberry & Hartle, 1998; McDonough, 1997; NCES, 2003; Pathways, 2003; Venezia, Krist, &Antonio, 2003).

The connection between these demographic characteristics and level of information and familiarity indicates that the decision-making process may be affecting whether or not individuals participate. The purpose of this study is to address the following research question:

How do differences in the decision-making process affect whether a student applies to colleges and universities?

In Chapter Two multiple streams of literature were brought together to form the theoretical basis for the study. First, the college choice literature was examined. The main findings mirror that of the access literature. Differences in decision making have been defined using demographic characteristics, information resources and social resources, which increases the familiarity with higher education in general. These findings form the basis for program strategies to address the access issue. Strategies focus on increasing the level of information parents and students possess, addressing the disparity found through research. They also provide a mentoring and counseling function to address the issues of social capital and familiarity with higher education, such as the admissions and financial aid process and what is required to get into college.

However, the disparities in access still exist. To provide a critique of the current strategies, communication theory was used. These strategies reflect a transmission model of communication (Beck, et al, 2004; Chandler, 1994; Shannon & Weaver, 1949). In the transmission model the information source, such as a higher education institution or an access program, develops a message and sends it through a channel, it may be an information campaign or through a program, to the intended receiver or audience, in this case parents and prospective students. The model takes an informational approach to the communication process, focusing on how information is transmitted between the source and the receiver. Communication becomes a linear, one-way process. As such,

the problems with communication are reduced to the question of accuracy of the message and the focus for improvement is the transmission process itself and mitigating noise. In this case the receiver is a passive target and the source has the control of defining the message based on its desired outcome, getting individuals to participate in higher education.

The findings of the access and college choice literature have defined the variables for analyzing the access problem as demographic-based characteristics and the level information and familiarity an individual possesses. Analyzing the disparities in information and familiarity has been defined by accuracy of the information and message and how accessible the information is. It is assumed that the audience will accept the message if it is received. However, little attention is paid to the reasons the audience may not accept the desired outcome or use the information to choose the desired outcome.

To address this issue, there are other models of communication that attempt to create a shared power in shaping the message. Rogers and Kincaid (1981) propose a dynamic process of communication, convergence theory, where mutual understanding is created still using information, but the information is created through a cyclical process of interpretation, perception and understanding for both the party with the message and the intended recipient. This model creates a different methodology for analysis. The variables of analysis are the interpretation and perception of information, instead of the receipt of information. These variables provide a greater level of

understanding that can be used to modify information used in access programs, as well as how the programs interact with their intended audience.

Dervin's Sense-Making model (1989) provides a methodology that focuses on examining the variables explained in the convergence model. Sense-Making is concerned with how individuals are using information, specifically how it is used to make sense of our experiences. The model centers around the assumption of discontinuity, that people create different meanings for information based on their own experiences, knowledge and interpretation. Accepting this fact means that information will be used differently by different people, and possibly not for the source's desired result. Connecting this to the access question, providing source-based information is not going to be effective in producing the desired result of increased participation in higher education. The problem may not be accessibility of information, but instead utilization of information. The question becomes whether the information serves the intended purpose of facilitating the individual's decision process.

The Sense-Making model is concerned with what predicts message use, which is central to the access problem. If individuals cannot use the information that is provided, they will be less likely to choose the desired outcome, participating in higher education. Dervin suggests that new categories be defined using people's perceptions of the decision situation and their resulting informational needs. This allows the audience to define the categories for analysis that can be used to adapt the information provided in order for it to be used more effectively.

The Sense-Making model asks individuals to reflect upon a decision making situation, describe the discontinuity the experienced and how they moved past it to come to a decision. The first variable, situation movement, allows the individual to describe the difficulties they faced in the decision situation. The perception of information variable allows the individual to describe the usefulness of information in their decision process. The final three variables describe how individuals moved through the process, the helps they used, the barriers they faced, and the helps they would have wanted. The variables defined here provide specific information about what is going wrong with the information dissemination and utilization process.

Analysis

The main contribution of this study is to define a set of variables that explain differences in the decision-making process that influence the decision of whether or not to apply to postsecondary education. The current model focuses on descriptive categories of the individuals who are not participating in higher education, defining them based on demographics and how much information and support they have. This study proposes that additional insight can be gained from the variables of the Sense-Making model. To analyze this proposition, a logistic regression analysis was performed to see which variables would have the greatest influence on the dependent variable, applying to postsecondary education. First, the analysis was performed using the variables representing the current descriptive model, or Demographics-Based model. For this study, the Demographics-Based model was defined by the following variables: first-generation status, income level, race and familiarity with higher education. An

additional three variables will be added to define who is describing the decision process, the prospective student, traditional aged (18-29) or an adult learner (30 and over), or a parent or other relative in their household. After the initial analysis, each of the variables of the Sense-Making model was added to regression to determine their predictive effect on applying. The Sense-Making model was defined by the following variables: situation movement, perception of information, the types of helps used in the process, the barriers in the process, and the types of helps wanted in the process.

To measure these variables, a telephone survey of 806 Virginians was conducted. A series of screening questions were used to determine if the respondent or someone in their household had considered whether or not to seek an education beyond high school. If the decision was for someone in the household, an additional question confirmed the respondent's involvement in the decision. The final study sample included 448 respondents. These respondents were asked a series of questions to measure the variables in both the Demographics-Based model and the Sense-Making model.

Principal Findings

Descriptive Analysis

In addition to the model testing, the survey also provided a descriptive analysis of the sample. The results indicated the shortcomings of information sources regarding postsecondary education. More than one in four respondents felt information was not supportive to their decision process, 13% saw it as a barrier and 30% specified wanting more informational support in the process. The information support they wanted

indicated needing a greater level of explanation and assistance to use it for the decision process.

The results also indicated a problem with finding a fit between personal needs or desires and the characteristics of schools, which was noted by 17% of the respondents. Additionally, 14% indicated what more social support in the process, suggesting that the individual needs assistance, like talking to others and support from family and friends to navigate the process. These findings are consistent with the literature on access and the college choice process.

Model Testing

The logistic regression analysis provided a set of variables that have a significant impact on the likelihood of a respondent deciding to apply to postsecondary education. Three variables increased the likelihood that the respondent would apply. Two of the demographic-based variables proved to be the most influential on the decision, income level and familiarity level. For both, for each increase in the level of the variable, the likelihood of applying increased. Access programs have the opportunity to directly influence familiarity level, which had the greatest impact by a large margin. One of the main purposes of the study was to better understand how individuals become familiar with higher education by examining their decision-making process, with the assumption that those who do not apply have a different decision process than those that do. Understanding these differences that affect familiarity can be useful in changing access program strategies to be more effective.

The analysis also provided a set of variables whose presence makes a respondent less likely to apply. Feeling a lack of control in choosing the decision outcome decreased the likelihood of applying by 49%. With regard to using information in the decision process, respondents who perceived information as hindering or having no effect on the decision process were 62% less likely to apply. The analysis also provided a description of the decision process of those who were less likely to apply. Respondents who used social support in decision process, or noted social support or school characteristics as a barrier also had a decreased likelihood of applying.

Group Analysis

The two group analysis defined the differences in the decision process for traditional aged respondents versus adult learners. While familiarity level with postsecondary education was a significant factor increasing the likelihood to apply for both groups, the variables that were decreasing the likelihood were different. For traditional aged students social supports, or lack thereof, were making the respondent less likely to apply. For adult learners, information not supporting their decision process was making the respondent less likely to apply. Both of these factors, social support and information, should function to increase overall familiarity with postsecondary education. Access programs can use these results to focus their efforts depending on the type of student they are serving.

Using the understanding provided by all of these findings the following recommendations can be made.

Recommendations

1) Create information that is more supportive to the decision-making process

The logistic regression analysis showed that respondents who indicate information was not supportive of their decision process were 60% less likely to apply. And while informational support as a barrier was not significant to the decision to apply, it was the most cited help wanted, with 30% of the sample. The responses that created the category of helps wanted were critical of the existing information, not just desiring to have had more in the process.

Programmatic dollars could be better spent funding research to develop responsive, useable information that can be widely disseminated to reach a large audience, not just those who participate in access advising programs. Future research can use focus groups to develop a definition of "supportive" that can be tested in a large sample survey.

2) *Information needs to accurately portray the work necessary to prepare for postsecondary education.*

The findings show that respondents who noted not having the credentials necessary to attend were less likely to apply. This reinforces the observation of Kane in Chapter One stating that students have the aspiration, but don't have the credentials when the time comes to apply (Sanoff, 2003). He relates this fact to students having unrealistic expectations about what it takes to attain a postsecondary education. Taking in to account the findings regarding information, one question that needs to be asked is if the information provided effectively portrays the preparation necessary to gain a higher

education or whether the information is too focused on marketing the idea that anyone can get a higher education.

Currently, access programs address the problem by trying to reach students at a younger age in order to give them the time to prepare and acquire the necessary credentials. For example, in 2007 the Lumina Foundation, the American Council on Education and the Ad Council created the KnowHow2Go campaign. This multiyear, multimedia effort includes television, radio and outdoor public service advertisements (PSAs) that encourage 8th through 10th graders to prepare for college using four simple steps. They encourage students to reach out to everyone to support their goal and to push themselves to prepare for getting into college. Students are also told to find the right fit between themselves and schools. And finally, that they can afford college and there is money available to help (KnowHow2Go.org, 2008). Based on the program's stated goals it addresses the need to portray the requirements of participating in higher education more clearly. The project used survey research with parents and students to form the basis of their information campaign. However, the stated findings from the research showed that "low-income and first generation students have high aspirations for college, but do not have clear information on what steps they need to take… and in low income households parents expect students to take the lead (KnowHow2Go, n.d.)." These findings do not directly relate to the information message and making information more useful to the population. Because the campaign has just ended its' first year, no evaluation data exists. Future research could integrate the findings of this study into an evaluation effort for the campaign to determine if school requirements

have less influence in whether individuals apply and to evaluate the information produced by the campaign.

3) *Provide more information about alternative options, other than a four-year institution, to gaining a postsecondary education*

The findings indicate that school characteristics, such as location and availability of part-time programs and certain majors, also posed a barrier which made respondents less likely to apply. Taken with the fact that online degree program had the lowest level of familiarity, with the mean being a 4.22 on a scale of one to ten, indicates that individuals may not be aware of all of the postsecondary options available to them. An online degree program would take care of the location and part-time program problem. And with the growing number of programs available, it may possibly address the availability of majors as well.

4) *Create participatory programming to deal with misperceptions and acceptance of information*

Participatory approaches to research and program development have potential to address these problems of utilizing information and having a lack of control over the decision outcome. Participatory research, based on the work of Paulo Freire, suggests that "learning was driven by people's own priorities and needs, respecting and building upon people's existing knowledge and skills, rather than starting from a 'deficit' model of individuals and communities as being in some way in need of 'treatment' (Woodward, 2004)." The emphasis is on creating experiential learning, through critical reflection and dialogue.

This approach is being used in health campaigns with groups such as children and young people (Ducket & Perry, 2005), older persons (Ritchie, Bernard & Trede, 2003; Brearly et al, 2005) and people in marginal groups (Power, 2002). One example is Be Well, a health focused community development project in Scotland. "Be Well as an organization is involved in the social inclusion and health inequalities agenda by working with local people to identify and meet their health needs and make these needs known at strategic policy and planning levels (Titterton & Smart, 2006)." A program with these goals would fit well into the access issue. The aim would be to correct misperceptions, through participatory discourse with program participants, and using understanding of the population to shape policy and program planning.

Policy Implications

One of the main conclusions of the study is that institutions and access programs should gain a better understanding of the population and adapt the information and access strategies to address their needs. The findings indicate respondents have a problem matching their needs with school characteristics and information is not playing the assumed role of facilitating the decision process. One of the theoretical contentions of the study is that the existing information and access programs are built on the transmission model of communication. The source, institutions and programs, have an intended outcome in mind when they create the information. However, that intended outcome may not match with the actual needs of the population or audience in question so the intended outcome does not take place. The conclusions of this study support this idea.

In the Commonwealth of Virginia access policy is focused on increasing the number of students who attain a baccalaureate degree. In the past five years, the mission of the community colleges has been redefined to first serve as a transfer vehicle on the road to attaining a four-year degree. This policy strategy is the result of a task force that was created by the former Attorney General Jerry Kilgore in 2003 to study the issue of access in the Commonwealth. The task force defined the two- to four- year institution transfer as one of the keys to the access problem and recommended how the transfer process could be streamlined to make it more efficient and effective (Task Force Report, 2003). Since the report's release a number of bills have been passed to implement the recommendations made. Guaranteed admissions agreements and dual admission agreements have been created to facilitate transferring community college courses to various four-year institutions in order to fulfill the baccalaureate degree requirements. Additionally, a number of bills were introduced in the 2008 General Assembly session that would use grant or scholarship money to create incentives for students to utilize the two- to four- year institution transfer route (SB 148, SB 125, HB 117, HB 512). Public colleges and universities are also held accountable for accepting transfer students as part of the strategic management process. As part of the Higher Education Restructuring Act of 2005, the number of transfer students accepted is a benchmark measurement in the management plans for each public college and university (Code of Virginia Ch.933 § 23-38).

The main reason to focus on increasing the number of individuals with a baccalaureate degree is economic. As stated in chapter one, the benefits of

postsecondary education have been defined in these terms. From an individual perspective, those with a baccalaureate degree make almost $1 million more over the course of their career than those who do not (Ruppert, 2003). Also, a baccalaureate degree makes an individual more marketable to employers. From an economic development perspective, prospective employers are interested in having a high number of individuals with baccalaureate degrees in the area because they are seen as a supply of qualified workers. Policymakers then focus on measuring and increasing a locality's human capital to reap the economic benefits of higher levels of employment and tax revenues.

While this strategy should be part of the overall picture, one must ask whether the access problem has been too narrowly defined from a policy perspective. The findings of this study indicate that the answer to that question is yes. While policy and programs should still focus on facilitating individuals gaining a baccalaureate degree, policymakers should also consider the benefits of the other types of postsecondary education. Certain prospective students may not have the desire or the personal circumstances necessary to attain a four-year degree, but they may be able to attain a 2-year technical degree which would also increase their income and marketability to employers. Policymakers are missing an opportunity to capture this economic benefit by having such a narrow policy approach to the access problem.

Limitations of the Study

The population for this study was the Commonwealth of Virginia, and while Virginia is representative of the nation as a whole on a number of variables related to

the access literature as discussed in chapter three, a national sample would capture all of the various types of prospective students for the study. In addition having a larger overall study sample would allow for larger subgroups, for instance, those who chose not to apply, or traditional students versus adult learners. Having a larger number in each subgroup would reduce the error rate for the resulting statistics.

Additionally, while the use of the telephone survey allowed for a larger sample, the collection method created time constraints in order to avoid interviewer fatigue. These time restraints meant that there was less depth to the questions and little probing from the interviewer. The study could have benefited from specific questions about the information sources used and follow-up questions about the process the respondent used.

While one contribution of this study is defining a quantifiable set of variables, there is inevitably a loss of richness in explanation of the responses. This research could be better defined if focus groups were conducted using the same variables to further investigate the quantitative results found here.

Future Research

One contribution of this study has been to take a qualitative methodology and quantify its variables for use in a large scale survey. The two Sense-Making variables, situation movement and perception of information, were measured using response categories specified in previous studies utilizing the model (Dervin & Nilan, 1999; Frenette, 1999; Nilan, 1985). Both of these variables were significant in the logistic regression analysis further justifying their use in future quantitative research.

Three open-ended questions were used for the variables helps used, barriers and helps wanted. These open-ended responses were coded to create initial categories and then five broad categories were identified that were consistent across all three of the variables: money, school characteristics, informational support, social support, and personal life characteristics. These five categories can used in future research projects to better define each and examine the relationship between them.

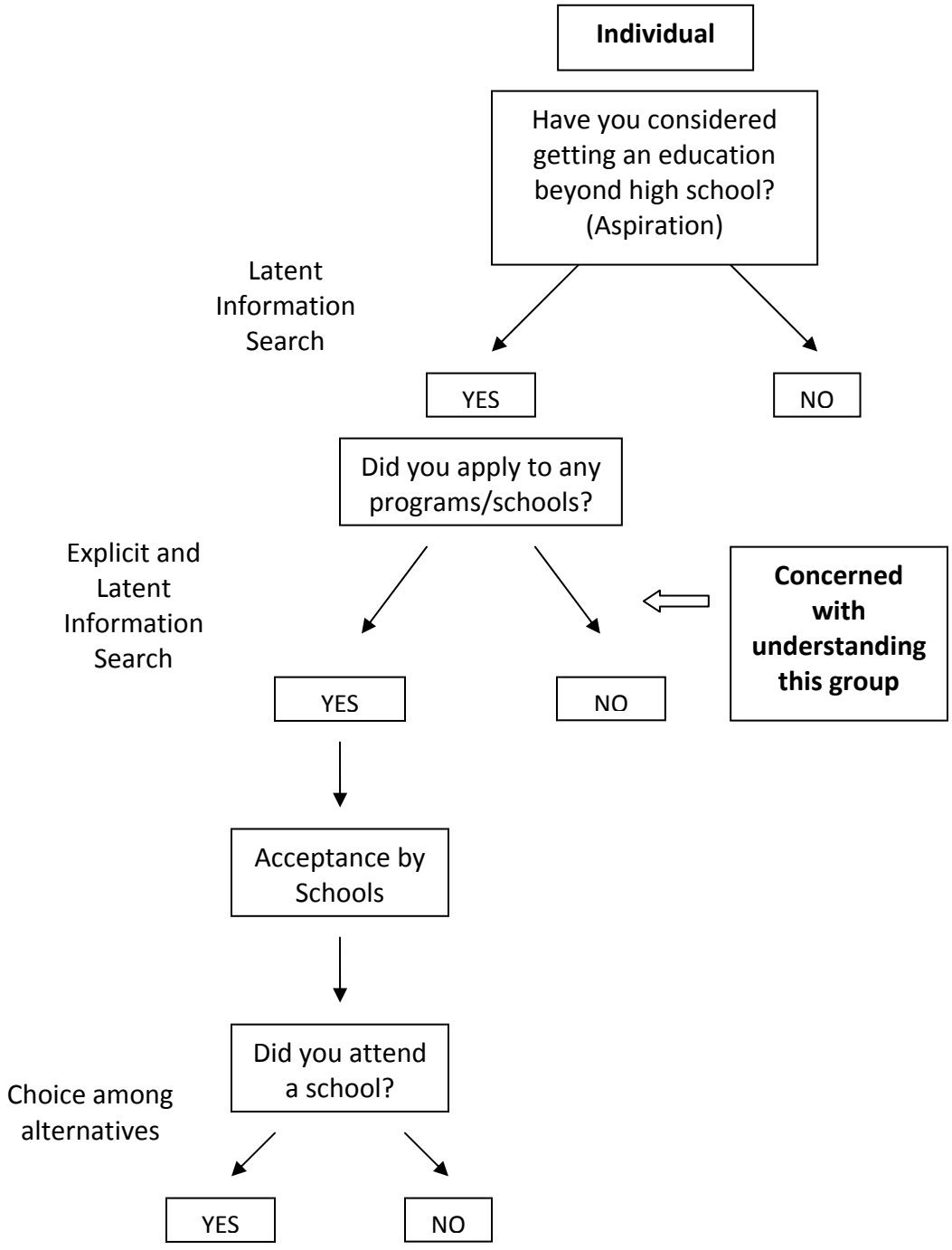
The results of the analysis provided two opportunities for further research. The first, discussed earlier in the chapter, is to define the meaning of supportive information. Also, this study indicated that noting money as barrier made a respondent almost twice as likely to apply to postsecondary education, which is contrary to the existing literature. As noted in Chapter Four, this may be because the decision not to apply occurs before paying for school is considered. This would indicate that money is not causing the decision not to apply, but other factors are more influential. Further research could examine this relationship.

Conclusion

The purpose of this study was to re-examine the variables used to analyze why individuals participate in postsecondary education, focusing on differences in the decision-making process. The results of the model testing provided a new set of variables that significantly impact the likelihood of applying to postsecondary education. These variables provided insight into the shortcomings of information and differences in the decision process that made a respondent less likely to apply. The findings were used to make specific recommendations that can make information more useable, not just

accessible, and create programs and information that are responsive to and include the program participants.

Appendix A: Stages of Decision Process



Latent search refers to the unstructured gathering of information through everyday experiences and interactions.

Explicit search refers to the more structured, deliberate gathering of information to make a specific decision.

Appendix B: Survey Text

Survey Text: College Choice and the Information Search Process

Hello, my name is _____, and I am calling from Virginia Commonwealth University in Richmond, Virginia. We are conducting a survey to find out what people think about higher education in Virginia. Your telephone number has been randomly selected to help us reach a representative sample of Virginians. May I verify that this is [PRFX]-[SUFX] in area code [AREA]?

[Insert screening protocol- start with youngest male in household, but then go to youngest female.]

Have I reached you on your home phone?

This is a voluntary survey. If you do not know the answer to a question or prefer not to answer, just say so and we'll skip it. If you choose to withdraw after we start just let me know. The survey will take about 10 minutes to complete and your responses will be kept confidential.

We'd like to ask you the following questions. Do I have your permission to continue?

My first questions are about types of higher education institutions.

1. Using a scale of 1 to 10, with 1 meaning not at all familiar and 10 meaning completely familiar, in general, how familiar would you say you are with:
    a. Four-year public universities
    b. Four-year private universities
    c. Community colleges
    d. Specialty technical colleges
    e. Online degree programs

    1-10 value, 88= don't know, 99= no answer

2. In the past five years, have you considered whether or not to seek an education beyond high school?

    [Interviewer: If respondent is currently enrolled in a post-secondary program, code as "YES". If respondent already holds a degree, probe with "Did you decide to seek that degree within the past five years?" and code accordingly.]
    a. Yes <1>
    b. No <2>

    If Q2=2, then Q3. If Q2=1, then Q5.

3. In the past five years, has anyone in your household considered whether or not to seek an education beyond high school?
    a. Yes <1>
    b. No <2>

    If Q3=2, then Q15. If Q3=1, then Q3b

3b. Was this a spouse or partner, your child, or someone else in your household? (If more than one, consider the most recent decision.)
    a. Spouse/Partner
    b. Child
    c. Other (specify)

4. Were you involved in making the decision?
    a. Yes <1>
    b. No <2>

    If Q4=2, then Q15. If Q4=1, then Q5

For the next section, if you were involved in more than one consideration decision, please answer the questions based on the decision that applied to you. If neither decision applied to you, please answer the questions based on the most recent decision.

5. What were some of the things that you needed or used in the decision-making process?
    [DO NOT READ LIST] (All that apply)
    a. Cost information
    b. School reputation/ ranking
    c. Availability of part-time status
    d. Admission requirements- grades, SAT/ACT scores needed
    e. Information about the location
    f. Parents' opinion
    g. Perception of family and friends
    h. Information about the sports program
    i. Information about the social life
    j. Input from a guidance counselor
    k. Financial aid assistance
    l. Location
    m. Other (specify)

6. Did you get to any point in the decision-making process where you had difficulty moving forward?
    a. Yes <1>

b. No <2>

If Q6=2, then Q8. If Q6=1, then Q7

7. Based on the following choices, how would you best describe that point in the decision-making process where you felt difficulty moving forward?
(Read responses)
    a. Seeing a number of options available
    b. Seeing an option but something or someone standing in the way
    c. Seeing no options available
    d. Seeing an option but as you moved through the decision-making process that option disappeared
    e. Seeing your options as being forced upon you

8. What were some of the barriers that you faced in the decision-making process?
[DO NOT READ LIST] (All that apply)
    a. Trouble finding information
    b. Trouble completing the applications
    c. Trouble completing the financial aid forms
    d. Didn't have the grades or test scores
    e. Didn't have the money
    f. Needed a part-time program
    g. Not enough help from the guidance counselor
    h. No barriers
    i. Other (specify)

If Q8 = a, then Q9. If Q 8= b through i then Q10

9. What topic(s) did you have trouble finding information about?
    a. List verbatim

10. What would have helped in the decision-making process?
[DO NOT READ LIST] (All that apply)
    a. Explanation of information
    b. Support from family
    c. Support from school/guidance counselor
    d. Having better grades/SATs
    e. Getting motivated
    f. Talking to others
    g. Other (specify)

11. Thinking about the information you used in your decision-making process, would you say it was supportive to your decision process, had no effect, or was hindering to your decision process?

a. Support
b. Neutral
c. Hinder

12. Did you or the person in your household end up attending a school?
    a. Yes <1>
    b. No <2>
    c. Haven't yet decided (VOL) <3>
    d. Don't Know <88>

If Q12 = 1, then Q14. If Q12= 2, 3, or 88, then Q13.

13. Did you or the person in your household end up applying to schools?
    a. Yes <1>
    b. No <2>
    c. Haven't yet decided (VOL) <3>
    d. Don't Know <88>

14. Was this decision for a first generation college student, meaning your/their parents and grandparents did not attend a college or university?
    Note: If they say "Yes, but I didn't graduate." = yes.
    a. No <1>
    b. Yes <2>
    c. Don't Know <88>
    d. No answer <99>

15. What is the highest grade of school or year of college you have completed?
    a. Less than high school graduate
    b. High school graduate
    c. Some college, Assoc. degree, comm. College
    d. College graduate, Bachelors
    e. Some graduate school
    f. Graduate or Professional degree
    g. Don't Know
    h. No answer

16. What was your total family income, before taxes, in 2006?

17. In what independent city or county do you live?

18. Are you of Hispanic or Spanish origin?
    a. No <1>
    b. Yes <2>
    c. Don't Know <88>

d. No answer <99>

19. Are you white, African-American, Asian or of some other racial background?
    a. White
    b. African-American
    c. Asian
    d. Other
    e. Don't Know
    f. No Answer

20. How old are you?
    a. 18-29
    b. 30-44
    c. 45-64
    d. 65 and older

Okay, that is the end of the survey. Thank you very much for your participation.

Appendix C: Variable Definition Table

Variables	Abbr.	Definitions/Survey Questions
Dependent Variable		
Applying to schools	App	Dummy variable based on response to Q12 & Q13
Independent Variable		
Demographic Model		
First-generation status	FG	Dummy variable: Q14
Income status	I	Continuous variable: Q16
Race	R	Categorical: White, Other or African-American Q19
Familiarity Index	FI	Average aggregated score of familiarity with five types of postsecondary institutions (scale: .1 to 1) Q1a-Q1e
Traditional student	TS	0=30 and over 1=18-29 Q20
Decision	D	0=Decision, other 1=Decision, self Q3
Adult learner	AL	0= Traditional students and parents 1= Adult learner Q3 & Q20 (age * decision)
Sense-Making Model		
Situation Movement		Respondent view of moving through decision process Dummy variable for each response option created then grouped into three categories Q6 & Q7
Control of Choice	CO	0= No 1 if Seeing a number of options available = 1
No Control of Choice	NC	0= No 1 if Seeing an option but something or someone standing in the way = 1 or Seeing no options available = 1 or Seeing an option but as you moved through the process it disappeared = 1 or Seeing your options as being forced upon you = 1
No difficulties		Indicated by 0 value for CO and NC
Perception of Information	PI	Respondent opinion of information used (Q11): Hindering, No effect, Supportive 1= Hindering, No effect 0= Supportive
Helps Used Indices		Open-ended: What was used in decision process (Q5)? Indices created from response categories
Money	HUm	(0, 1)

Variables		Abbr.	Definitions/Survey Questions
	School Characteristics	HUsc	Location Availability of part-time status Admission requirements Degrees/programs offered and curriculum requirements Flexibility in scheduling Campus safety Transferability of credits (Aggregated score = 0-7)
		HUsc1	(0, 1) Used school characteristic(s) 1 = HUsc ≥ 1
	Informational Support	HUis	Cost information Information about social life Information about sports program Online information Print information School ranking/reputation Campus visit Input from guidance counselor Career and income opportunities post-graduation (Aggregated score = 0-9)
		HUis1	(0, 1) Used informational support 1 = HUis ≥ 1
	Social Support	HUss	Perception of family and friends Parent's opinion Advising services (Aggregated score = 0-3)
		HUss1	(0, 1) Used social support 1 = HUss ≥ 1
	Personal life	HUpl	Student's career aspirations Time Child care (Aggregated score = 0-3)
		HUpl1	(0, 1) Used personal life characteristic(s) 1 = HUpl ≥ 1
	Other	HUoth	(0, 1)
Barriers			Open-ended: What were barriers to the decision process (Q8)? Indices created from response categories
	Money	Bm	(0, 1)
	School Characteristics	Bsc	Needed a part-time program Didn't have the grades or test scores Location Didn't offer courses or program Acceptance by school (Aggregated score = 0-5)
		Bsc1	(0, 1) School characteristic barrier(s) 1 = Bsc ≥ 1

Variables		Abbr.	Definitions/Survey Questions
	Informational Support	Bis	Trouble finding information Trouble completing financial aid forms Trouble completing applications Not enough help from guidance counselor (Aggregated score = 0-5)
		Bis1	(0, 1) Informational support barrier(s) 1 = Bis ≥ 1
	Social Support	Bss	Student disagrees with parent Motivation Friends (Aggregated score = 0-2)
		Bss1	(0, 1) Social support barrier(s) 1 = Bss ≥ 1
	Personal Life	Bpl	Time Family obligations Work obligations Travel or transportation Personal circumstances Hesitation regarding choosing school or major (Aggregated score = 0-4)
		Bpl1	(0, 1) Personal life barrier(s) 1 = Bpl ≥ 1
	Other	Both	(0, 1)
Helps Wanted			Open-ended: What would have helped in the process (Q10)? Indices created from response categories
	Money	HWm	(0, 1)
	School Characteristics	HWsc	Having better grades/SATs Flexibility in scheduling Closer proximity Different curriculum or program (Aggregated score = 0-4)
		HWsc1	(0, 1) Wanted school characteristic(s) 1 = HWsc ≥ 1
	Informational Support	HWis	Explanation of information Support from school/guidance counselor More/better information Ability to talk with someone at the school Visited schools
		HWis1	(Aggregated score = 0-4) (0, 1) Wanted informational support 1 = HWis ≥ 1

Variables		Abbr.	Definitions/Survey Questions
	Social Support	HWss	Talking to others Support from family Getting motivated (Aggregated score = 0-3)
		HWss1	(0, 1) Wanted social support 1 = HWss ≥ 1
	Personal Life	HWpl	Time Remove family obligations Remove work obligations Change personal circumstances (Aggregated score = 0-4)
		HWpl1	(0, 1) Wanted personal life characteristic(s) 1 = HWpl ≥ 1
	Other	HWoth	(0, 1)

Appendix D: Survey Topline

Descriptive Statistics[1],[2]

Q1. In the past five years, have you considered whether or not to seek an education beyond high school? [QUESTION WAS ASKED OF ALL VIRGINIANS]
[Interviewer: If respondent is currently enrolled in a post-secondary program, code as "YES". If respondent already holds a degree, probe with "Did you decide to seek that degree within the past five years?" and code accordingly.]

	%	N[3]
Yes	44	310
No	56	493
DK/NA	0	3
Total	100	806

IF NO or DK in Q1 ASK:
Q2. In the past five years, has anyone in your household considered whether or not to seek an education beyond high school?

	%	N
Yes	35	185
No	65	310
DK/NA	0	1
Total	100	496*

*496 respondents (those answering No or DK/NA to Q1) were asked the question.

SUMMARY TABLE

	All adults	
	%	N
Respondent considered (Yes in Q1)	44	310
Other household member considered (Yes in Q2)	20	185
Neither (No in Q1 and Q2)	36	307
DK/NA (in either Q1 or Q2)	0	4
Total	100	806

[1] Percentages may add to 99 or 101 due to rounding.
[2] Cells with zero percent contain cases, but the percentage is less than 0.5%.
[3] For data reporting sample counts are unweighted and percentages are weighted.

IF YES in Q2 ASK:
Q2b. Was this a spouse or partner, your child, or someone else in your household? (If more than one, consider the most recent decision.)

	All adults	
	%	N
Child	72	140
Spouse/Partner	15	22
Other	13	23
DK/NA	0	0
Total	100	185*

*185 respondents (those answering Yes to Q2) were asked the question.

Q3. Were you involved in making the decision?

	All adults	
	%	N
Yes	74	138
No	26	46
DK/NA	0	1
Total	100	185*

*185 respondents (those answering Yes to Q2) were asked the question.
** Only respondents who stated they were involved in the decision-making process were included in the study sample

FINAL STUDY SAMPLE BY DECISION PARTICIPATION (N=448)			All adults
	%	N	%
Respondent considered in past five years	75	310	44
Household member considered and respondent was involved in that decision	25	138	14
Child	19	112	11
Spouse/Partner	4	15	2
Other	2	11	1
Total	100	448	58

FINAL STUDY SAMPLE BY AGE (N=448)	18-29		30-44		45 and older		DK/NA	
	%	N	%	N	%	N	%	N
Respondent considered in past five years	36	86	38	97	25	115	2	12
Household member considered and respondent was involved in that decision	5	4	25	23	69	109	1	2
Child	2	1	21	15	77	94	1	2
Spouse/Partner	16	2	61	8	23	5	0	0
Other	15	1	0	0	85	10	0	0
Total		90		120		224		14

STUDY GROUPS	%	N
Adult respondents who considered in past 5 yrs.	75	310
Traditional student (age 18-29)	27	86
Non-traditional adult student (30 and older)	47	212
No age response	2	12
Adult respondents who participated in decision with household member	25	138
Parent	19	110
Other relationship	6	26
No age response	0	2
Total	100	448

[For the remainder of the survey the entire study sample (N=448) was asked the questions, unless otherwise noted.]

For the next section, if you were involved in more than one consideration decision, please answer the questions based on the decision that applied to you. If neither decision applied to you, please answer the questions based on the most recent decision.

Q4. What were some of the things that you needed or used in the decision-making process?

[DO NOT READ LIST] (All that apply; other record verbatim)

	Yes*	No	DK/NA
	%	%	%
Cost information	41	55	4
Location	33	63	4
School reputation/ranking	16	80	4
Financial assistance	13	83	4
Perception of family and friends	8	88	4
Availability of part-time status	6	90	4
Admission requirements	5	91	4
Input from guidance counselor	4	92	4
Parent's opinion	3	93	4
Information about social life	2	94	4
Information about sports program	1	95	4
Other	33	63	4

Other Verbatim Responses*	%
Degrees/programs offered and curriculum requirements	18
Online information	8
Career and income opportunities post-graduation	4
Print information	4
Flexibility in scheduling	3
Student's career aspirations	2
Time	2
Campus visit	1
Campus safety	1
Transferability of credits	1
Advising services	1
Child care	1
Other	15

* Multiple responses allowed- percentages represent number of respondents providing particular response.

Q5. Did you get to any point in the decision-making process where you had difficulty moving forward?

	%	N
Yes	30	132
No	68	311
DK/NA	1	5

IF YES in Q5 ASK:
Q6. Based on the following choices, how would you best describe that point in the decision-making process where you felt difficulty moving forward? [Read response options]

	% asked (had difficulty)	N
Seeing a number of options available	21	29
Seeing an option but something or someone standing in the way	30	38
Seeing no options available	5	6
Seeing an option but as you moved through the decision-making process that option disappeared	22	28
Seeing your options as being forced upon you	10	14
DK/NA	12	17
Total	100	132*

*132 respondents (those answering Yes to Q5) were asked question

SUMMARY TABLE Q5 and Q6

	%	N
Had difficulty moving forward (Yes in Q5)	30	132
Seeing a number of options available	7	29
Seeing an option but something or someone standing in the way	10	38
Seeing no options available	1	6
Seeing an option but as you moved through the decision-making process that option disappeared	7	28
Seeing your options as being forced upon you	3	14
DK/NA type of difficulty (DK in Q6)	4	17
No difficulties (No in Q5)	68	311
DK if difficulty (DK in Q5)	1	5
Total	100	448

Q7. What were some of the barriers that you faced in the decision-making process? [DO NOT READ LIST] (All that apply; other record verbatim)

	Yes	No	DK/NA
	%*	%	%
Didn't have the money, costs	25	71	4
Trouble finding information	7	90	4
Needed a part-time program	5	91	4
Trouble completing the financial aid forms	4	92	4
Didn't have the grades or test scores	4	93	4
Trouble completing the applications	3	94	4
Not enough help from guidance counselor	2	94	4
No barriers	23	73	4
Other	28	68	4

Other Verbatim Responses*	%
Time	9
Hesitation re-choosing right school or major	8
Family obligations	8
Location	5
Work obligations	4
Didn't offer courses or program	3
Acceptance by school(s)	2
Student disagrees with parent	1
Travel, transportation	1
Motivation	1
Personal circumstances	1
Friends	1
Other	5

* Multiple responses allowed- percentages represent number of respondents providing particular response.

Q8. What would have helped in the decision-making process?
[DO NOT READ LIST] (All that apply; other record verbatim)

	Yes	No	DK/NA
	%*	%	%
Explanation of information	13	77	10
Support from school/guidance counselor	8	83	9
Talking to others	7	83	9
Support from family	4	86	9
Getting motivated	4	87	9
Having better grades/SATs	1	89	9
Other	31	60	9

Other Verbatim Responses*	%
Having more money	18
More/better information	11
Flexibility in scheduling	4
Remove family obligations	3
Ability to talk with someone at the school	3
Time	2
Remove work commitments	2
Visited schools	2
Closer proximity	1
Different curriculum or program	1
Change personal circumstances	1
Other	6

* Multiple responses allowed- percentages represent number of respondents providing particular response.

Q9. Thinking about the information you used in your decision-making process, would you say it was supportive to your decision process, had no effect, or was hindering to your decision process?

	%
Supportive	68
Neutral	16
Hindering	12
DK/NA	3

Q10. Did you or the person in your household end up attending a school?

	%	N
Yes	79	358
No	18	74
Haven't decided yet	3	16
DK/NA	0	0
Total	100	448

ASK IF NO, Haven't decided yet or DK/NA in Q10:
Q11. Did you or the person in your household end up applying to schools?

	%	N
Yes	22	18
No	67	60
Haven't decided yet	11	12
DK/NA	0	0
	100	90*

* 90 respondents (those who answered No, Haven't decided yet or DK/NA to Q10) were asked the question.

Summary: Decision to apply		
	%	N
Attended	79	358
Applied, did not attend	5	18
Did Not Apply	14	60
Haven't decided yet	2	12
DK/NA	0	0
	100	448

Q12. Using a scale of 1 to 10, with 1 meaning not at all familiar and 10 meaning completely familiar, in general, how familiar would you say you are with [INSERT ITEM; RANDOMIZE]

a. Four-year public universities	
	%
1 Not at all familiar	5
2	2
3	5
4	3
5	9
6	7
7	14
8	20
9	8
10 Completely familiar	26
Don't know/Refused	1
Mean	7.2

b. Four-year private universities	
	%
1 Not at all familiar	15
2	5
3	7
4	8
5	13
6	6
7	14
8	12
9	3
10 Completely familiar	16
Don't know/Refused	2
Mean	5.7

c. Community Colleges	
	%
1 Not at all familiar	6
2	5
3	5
4	6
5	12
6	12
7	13
8	15
9	6
10 Completely familiar	20
Don’t know/Refused	1
Mean	6.6

d. Specialty technical colleges	
	%
1	24
2	12
3	9
4	11
5	13
6	8
7	6
8	5
9	1
10	8
Don’t know/Refused	2
Mean	4.2

e. On-line degree programs	
	%
1	26
2	12
3	10
4	9
5	12
6	6
7	5
8	4
9	2
10	10
Don't know/Refused	3
Mean	4.2

Summary table	**Mean rating of familiarity**
Four-year public universities	7.2
Four-year private universities	5.7
Community Colleges	6.6
Specialty technical colleges	4.2
On-line degree programs	4.2

Familiarity index*	
	%
Low	23
Medium	56
High	22
Mean	5.4

*Aggregated score of 5 familiarity Qs: Low= 0-3; Medium= 4-6; High= 7-10

Q13. Was this decision for a first generation college student, meaning your/their parents and grandparents did not attend a college or university?

Note: If they say "Yes, but I didn't graduate." = yes.

	%	N
Yes	39	170
No	61	276
DK/NA	0	2
	100	448

Q14. What was your total family income, before taxes, in 2006?

	%	N
Under $20,000	6	23
$20,000-$34,999	9	34
$35,000-$49,999	14	61
$50,000-$69,999	13	63
$70,000 and above	41	196
DK/Refused	17	71
Total	100	448

Q15. Are you white, African-American, Asian or of some other racial background?

	%	N
White	69	340
African-American	21	67
Asian	2	5
Other	5	22
DK/Refused	3	14
Total	100	448

	%	N
White, Other	76	367
African-American	21	67
DK/Refused	3	14
Total	100	448

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VITAE

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EDUCATION

PhD Candidate in Public Policy, expected 2008
Virginia Commonwealth University, Richmond, Virginia
Dissertation Title: Making Sense of the Access Problem: A New Methodology for Analyzing the Postsecondary Education Decision

Master of Arts in Public Administration, 2002
Virginia Commonwealth University, Richmond, Virginia

Bachelor of Arts in Government, 1997
College of William and Mary, Williamsburg, Virginia

RESEARCH INTERESTS

Higher education policy, specifically access and accountability decision making
Economic development policy

TEACHING INTERESTS

American Government
Public Administration Principles
Public Policy
Research Methods
Survey Research and Polling

ACADEMIC EXPERIENCE

Internship Program Coordinator and Instructor, L. Douglas Wilder School of Government and Public Affairs, Virginia Commonwealth University
Richmond, VA, August 2004- present

- Work with state agencies, non-profit organizations and other public entities to secure internship opportunities for students; assist students in choosing positions and making career choices; and instruct internship course for academic credit
- Develop various research projects; create survey instruments and web-based surveys using Inquisite; analyze data in SPSS; author research reports for clients and publication.
    - Commonwealth Poll 54
    - Metro Poll 18
    - Commonwealth Poll 57
    - Life Sciences Poll 2007
    - Commonwealth Education Poll 2008
    - Commonwealth Poll 58 (Spring 2008)
- Shockoe Advisory Committee: provide staff support and assist with final report to the Mayor
- Business Climate Study for the Council on Virginia's Future: conduct qualitative interviews with CEOs of various Virginia companies and assist in creating survey instruments
- Course: U.S. Government
- Course: Introduction to Public Administration
- Course: Public Opinion, Polling and the Media

- Course: Research Methods
- Course: Public Policy

CONSULTING EXPERIENCE

Historic Polegreen Church Foundation, Education Consultant, July 2008

- Create strategic plan for civic education programming; identify central themes and concepts to be used to create lesson plans; develop reading lists and web resources for teachers and other users; develop activities around primary source documents; and propose and evaluate the development of educational symposiums and forums for the Foundation.

PRACTITIONER EXPERIENCE

Assistant Vice President, Arbitrage Analyst, Virginia State Non-Arbitrage Program
Richmond, VA, 2000- 2004

- **Management of program:** Manage and oversee operation of state program and daily accounting of the SNAP Money Market Fund (assets appr. $2 billion); provide monthly management report for review by Treasury Board; audit operational flow and make necessary procedural changes; deal with contract and compliance issues with the VA Treasury Board.
- **Arbitrage and investment management:** Assist clients in structuring bond issues with respect to investment and tax needs; assist clients in evaluating investment alternatives; perform complex future-value analyses of arbitrage liabilities in Excel; forecast investment earnings based on expenditure draw schedules; monitor compliance with arbitrage regulations including processing exception reports and contacting and counseling clients.
- **Training:** Provide client training regarding the program, investment alternatives, and arbitrage regulations in general; provide training and marketing presentations at various VA government finance conferences.
- **Database maintenance:** Maintain SQL database used to track arbitrage compliance of all bond issues invested with the program; work with programming consultant to develop code for database improvements and to ensure data integrity.

Policy Analyst, Virginia Department of Treasury
Richmond, VA, 1998- 2000

- **Policy analysis and bond issuance:** Provide high-level technical support and use of planning and analytical skills in the planning, structuring and issuing of General Obligation and appropriation-supported bonds; review and analysis of financing plans and feasibility studies; development of planning documents; preparation of cash flow, debt service, arbitrage, and other analyses and reports; coordination of the closing process with bond counsel, financial advisor and underwriter.
- **Master Equipment Leasing Program:** Serve as day-to-day coordinator; review and resolve discrepancies in contracts and processing requests for funding in a timely manner; maintain the lease database and prepare accurate monthly reports for the Treasury Board.
- **Legislative:** Track pertinent legislation and prepare Legislative Action Summaries and Fiscal Impact Statements for Governor for bills related to debt issuance; attend committee meetings to track changes to debt issuance bills.

Administrative Staff Assistant, Virginia Department of Treasury
Richmond, VA, 1997-1998

- **General Management:** Assist with preparation of Monthly Statistical Highlights and Quarterly Management Reports; attend Treasury Board meetings and prepare minutes; prepare presentations and materials and assist in planning agency-wide meetings; assist HR Director with development and implementation of agency-wide goals and objectives; assist Treasurer and Deputy Treasurer with projects as needed; in the absence of the HR Director,

supervise the front desk activities and staff; maintain records management, FOIA compliance, and the agency library.

- **Legislative:** Read introduced legislation and distribute to Directors and provide weekly tracking reports; compile daily committee agenda tracking reports for Senior Staff and the Treasurer.

PUBLICATIONS

Graham, F. S. & Flippen, E.L. & (forthcoming). Increasing demand means increasing access and information. *Higher Education Quarterly.*

Flippen, E.L. & Graham, F. S. (2005). The energy policy act: A missed opportunity. *PA TIMES.* 28.10, November.

Flippen, E. L. & Graham, F.S. (2005). Increasing access to higher education in Virginia. *Virginia Business*, November.

Flippen, E. L. & Graham, F. S. (2005). Meeting Virginia's future demand for higher education. *International News*. 57, Spring.

Graham, Farrah, "Trustee and custodial services- State Non-Arbitrage Programs" In N. Greifer (Ed.), Banking Services: A Guide for Governments, Chicago: Government Finance Officers Association Publications.

PRESENTATIONS

Public Perception and Knowledge of Community Colleges in Virginia, Presented at the Annual Meeting of Virginia Community Colleges, Portsmouth, VA, November 2007.

A View from the Middle: A Case Study of SCHIP Implementation Across Levels of Government, Presented at the Annual Conference of the American Society of Public Administration, Washington, DC, March 2007.

Legislative Priorities for Higher Education, Presented at the Virginia Conference of the American Association of University Professors, Norfolk State University, October 2006.

Addressing Questions of Access by Better Understanding the Question: How Survey Research Can Inform Higher Education Policy. Presented at the Annual Conference of the Society for Research in Higher Education, University of Edinburgh, December 2005.

Institutional Reporting: Responding to What Parents, Students, and the Public Want to Know. Presented at the National Conference on Higher Education, Atlanta, GA, March 2005

Meeting Virginia's Future Demand for Higher Education. Presented at the Annual Conference of the Society for Research in Higher Education, University of Bristol, December 2004

Accountability in Higher Education. Presentation to the SJR 74 Study Commission, Virginia General Assembly, December 2004

Refundings and Transferred Proceeds. Presented at the Virginia Government Finance Officers Association Conference, Virginia Beach, VA, May 2003

Arbitrage: What Participants Need to Know, Presented at the Virginia Resources Authority Conference, Roanoke, VA, March 2002

An Introduction to Arbitrage and the Virginia State Non-Arbitrage Program, Presented at the Virginia Government Finance Officers Association Conference, Virginia Beach, VA, May 2001

PUBLIC SERVICE

Chair, United Way Family, Youth and Children Action Council, 2001- present

HONORS

Pi Alpha Alpha, National Honor Society for Public Affairs and Administration

PROFESSIONAL AFFILIATIONS

Society for Research in Higher Education, 2004- present
Association for Public Policy and Administration Management, 2005-present